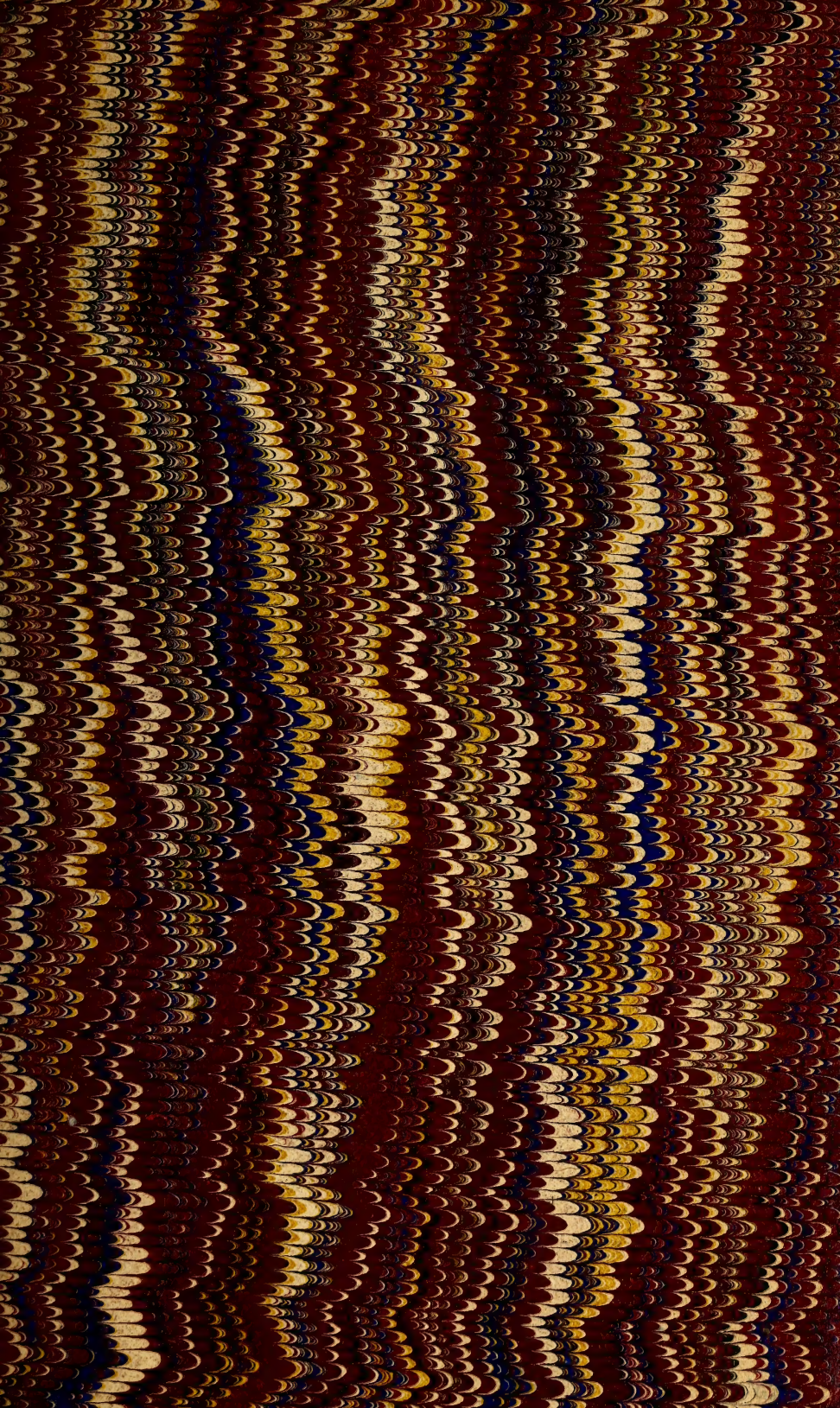


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Fig. 1



Fig. 2

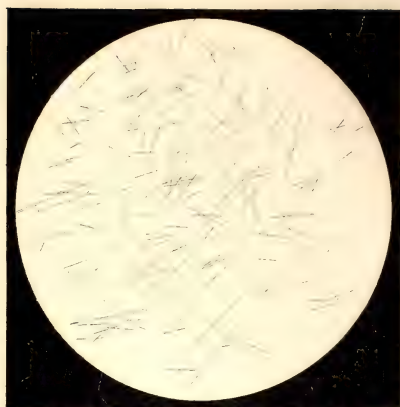


Fig. 3

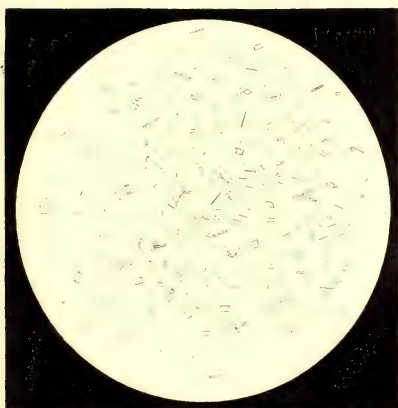


Fig. 4

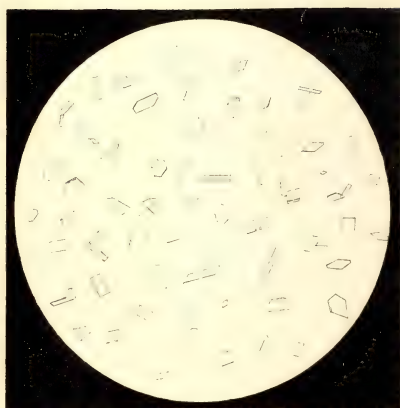


Fig. 5

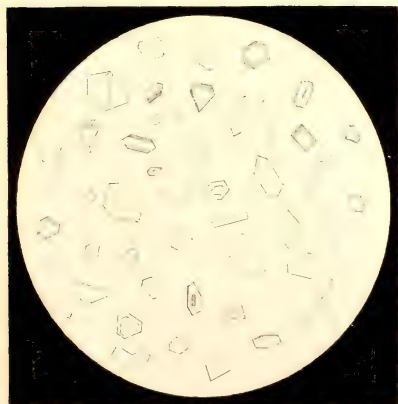
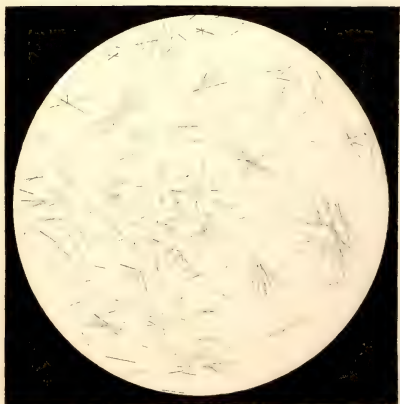


Fig. 6



THE
AMERICAN JOURNAL OF PHARMACY.

JANUARY, 1870.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE CHEMICAL COMPOSITION OF GELSEMIUM SEMPERVIRENS.

Case of fatal poisoning by three drachms of the fluid extract, and recovery of the poison some months after death.

By THEO. G. WORMLEY, M.D.,

Professor of Chemistry and Toxicology in Starling Medical College.

Having recently been solicited to make a chemical examination of the contents of the stomach of a woman who, it was claimed, had administered to her, through the mistake of a druggist, a quantity of the fluid extract of gelsemium* and died from its effects, we found it necessary, before undertaking the examination, to ascertain whether this substance really contained any principle or principles by which its presence could be certainly determined. For this purpose, we made a series of experiments upon the fluid extract of gelsemium, prepared by Tilden & Co., and found it to contain a new organic acid, which may be denominated *gelseminic acid*, and a strongly basic or

EXPLANATIONS OF THE PLATE

Illustrating Dr. Wormley's paper on Gelsemium sempervirens.

FIG. 1. Gelseminic acid from ethereal solution, $\times 20$ diameters.

" 2. " " hot supersaturated aqueous solution, $\times 75$ diameters.

" 3, 4, 5. Gelseminic acid, sublimed, $\times 75$ diameters.

" 6. Gelseminic acid, precipitated by corrosive sublimate, $\times 75$ diameters.

* A concentrated tincture of the root of Gelsemium of the strength of 480 grains to each fluidounce.—EDITOR.

alkaloidal principle, which, being the active principle of the drug, may be named *gelseminine*, *gelseminia* or *gelsemia*.

It has been known for some years that this drug contained a very active poisonous principle, but, so far as we are aware, the only published accounts relating to its chemical properties are the two heretofore published in this Journal: the first by H. Kollock, May 1855, p. 197, and the other by C. L. Eberle, January, 1869, p. 35. Neither of these experimentalists, however, satisfactorily succeeded in isolating and ascertaining the chemical properties of this principle.

Before entering into the details of the above case of poisoning, the methods by which the new acid and base may be obtained, together with their respective chemical properties, will be pointed out.

I. GELSEMINIC ACID.

Preparation.—Gelseminic acid may be obtained from the fluid extract of gelsemium by the following method: Concentrate the fluid extract on a water-bath to about one-eighth of its volume, then add to the concentrated extract several times its volume of pure water and allow the mixture to stand several hours, or at least until the supernatant liquid has become very nearly or altogether clear. By this treatment most of the resinous matter, held in solution by the alcohol originally present, will be separated. The mixture is then transferred to a filter, the solids well washed with water, and the filtrate thus obtained, together with the washings, concentrated on a water-bath to about the same volume the concentrated extract had prior to the addition of the pure water. The concentrated liquid, after filtration, if necessary, is acidulated with hydrochloric acid in the proportion of one drop of the pure acid for each fluid ounce of the fluid extract operated upon, then thoroughly agitated with about twice its volume of ether; after the liquids have completely separated, the ethereal fluid is decanted and the aqueous solution again agitated with a similar quantity of ether, which in its turn is decanted and the aqueous liquid finally washed with about its own volume of ether.

On allowing the united ethereal liquids thus obtained to evapo-

rate spontaneously, the gelseminic acid will be left chiefly in the form of nearly colorless groups of crystals, of the forms illustrated in plate, fig. 1, together with more or less yellowish or brownish resinous matter. The crystals may be washed with a small quantity of cold absolute alcohol, which will readily dissolve the adhering coloring matter without acting much upon the crystals themselves. The alcohol thus employed may be evaporated spontaneously, when a second crop of crystals will be obtained; these are also washed with alcohol and added to the former crystals. To further purify the crystals, they are diffused in a small quantity of hot water and extracted from the cooled mixture by chloroform, which on spontaneous evaporation will leave them very nearly or altogether colorless.

To recover and purify the gelseminic acid taken up and held in solution by the alcohol employed to wash the above crystals, the liquid is evaporated to dryness and the residue treated with a small quantity of water, and sufficient caustic potash added to just neutralize the liquid, by which the organic acid will be dissolved in the form of a salt of the alkali. This solution is filtered, the filtrate treated with slight excess of basic acetate of lead, and the precipitate, consisting of the gelseminate of lead, collected on a filter and washed. The washed residue is diffused in an appropriate quantity of water and treated with excess of sulphuretted hydrogen gas, which will decompose the lead-salt with the precipitation of the metal as sulphuret and the elimination of the organic acid. This mixture is heated to about the boiling temperature, to dissolve the organic acid, and filtered while still hot, and the residue washed with a little alcohol, which is collected with the first filtrate. The filtrate may now be concentrated and the organic acid extracted by chloroform, which on spontaneous evaporation will leave it in its crystalline state.

As the average of several experiments, after the above method, sixteen ounces of the fluid extract of gelsemium yielded about two grains and a quarter of pure gelseminic acid.

Chemical Properties.—In its pure state, gelseminic acid is a colorless, odorless, nearly tasteless solid, which is readily crystallizable, usually forming groups or tufts of delicate needles. It

has strongly acid properties, completely neutralising bases and uniting with them to form salts, most of which, excepting those of the alkalies, are at most only sparingly soluble in water. The salts of the acid having an alkaline base, are very freely soluble in water and are crystallisable. The pure acid is freely soluble both in chloroform and in ether, but only sparingly soluble in water, requiring about one thousand times its weight of this liquid for solution. It is much more freely soluble in hot water, from which, however, the excess immediately begins to separate, in the form of long slender needles, as the solution cools. Plate, fig. 2.

If a small quantity of gelseminic acid, or of any of its salts in the solid state, be treated with a drop of concentrated *nitric acid*, it dissolves under a yellow coloration to a yellow, reddish or red solution, the final color depending upon the relative quantity of the organic acid present. If this solution be now treated with excess of ammonia, it acquires a deep blood-red color, which is permanent, at least for some hours. $\frac{1}{100}$ th of a grain of the acid, when treated after this manner, will yield a deep blood-red coloration; $\frac{1}{1000}$ th grain yields a similar coloration. The $\frac{1}{10,000}$ th of a grain of the acid yields, under the action of nitric acid, a well-marked yellow coloration, which under the action of ammonia assumes a pale-red hue. The nitric acid solution of even the $\frac{1}{30,000}$ th of a grain of the organic acid acquires, when treated with ammonia, a distinct reddish coloration. The production of this red coloration is highly characteristic of the organic acid.

Sulphuric acid dissolves the organic acid, as also most of its salts, under the production of a yellow color, to a brown or reddish-brown solution, which, upon the application of a moderate heat, acquires a dark chocolate color. The addition of bichromate of potash to a sulphuric acid solution of the organic acid, causes no striking change.

Hydrochloric acid has little or no action upon the organic acid.

Caustic Potash, Soda or Ammonia, when added to gelseminic acid, causes it to assume an intense yellow color, and quickly dis-

solves it, in the form of a salt, to a solution having very striking fluorescent properties, even when very highly diluted. A solution of this kind containing $\frac{1}{100}$ of its weight of the acid, when examined in a small glass tube by transmitted light, has a strong yellow color; under reflected light, a deep bluish appearance; and under a cone of sun-light condensed upon it with an ordinary hand lens, an intense blue color along the path of the condensed rays.

When the solution contains $\frac{1}{1000}$ th of its weight of the acid, it presents, under transmitted light, a greenish-yellow appearance, the surface of the liquid at the same time appearing of a deep blue color; by reflected light, it presents a strong greenish-blue, and under condensed light, a deep blue coloration.

A 10,000th solution of the acid presents, under transmitted light, only a faint yellowish hue, with a blue surface; but under reflected light it appears of a deep blue color, even more intense than a 1000th solution.

A 100,000th solution is colorless, or at most presents only a faint bluish hue under transmitted light; under reflected sun-light, however, it presents a strongly marked blue appearance; and when examined by condensed sun-light, the path of the condensed beam, as it passes through the solution, presents a deep blue appearance. This blue coloration is also observed by looking down the tube containing the solution upon the surface of the liquid. Even one grain of such a solution, when contained in the end of a pipette and examined under condensed sun-light, exhibits a very distinct blue appearance.

Solutions more dilute than the last mentioned appear nearly or altogether colorless under transmitted and reflected light; but even a single drop of a solution containing only the $\frac{1}{1000000}$ th part of its weight of the acid, when contained in the end of a pipette and examined under a cone of condensed sun-light, presents a quite perceptible blue coloration along the path of the condensed rays.

If a large test tube, or any similar vessel, nearly filled with water, be placed against a black ground in direct sun-light, and view obliquely from the front, and then a drop of an alkaline solution of the organic acid be dropped into the tube, a very

beautiful deep blue coloration will manifest itself along the path of the drop as it slowly diffuses itself through the water, especially if the diffusion be observed under a cone of condensed sun-light. A single drop of a 10,000th solution of the acid, when examined in this manner, yields an intense blue coloration along the path of the alkaline liquid. Even a drop of a 100,000th solution gives rise to a very satisfactory blue coloration.

The commercial fluid extract of gelsemium, when rendered alkaline and diluted with water, presents appearances, in regard to color, similar to those above described, even if the extract be largely diluted. Thus, if the extract be rendered alkaline, and diluted with one hundred parts of water, the mixture presents a strongly marked blue appearance when examined by looking into the tube containing the mixture. Even when diluted with one thousand parts of water, it still presents, under condensed light, a very distinct blue coloration, even if only a few drops of the mixture be examined.

In respect to the manifestation of a blue appearance under the action of light, solutions of gelseminic acid resemble somewhat those of quinine, with, however, this marked difference, that in the case of the latter substance the coloration is only observed when the solution has an acid reaction, whereas in the case of gelseminic acid the coloration manifests itself only in the presence of an alkali, the bluish appearance immediately disappearing on the addition of an excess of an acid.

When cautiously heated upon platinum foil, pure gelseminic acid fuses to a colorless liquid, which, as the heat is increased, darkens in color, gives off white fumes and is finally dissipated without residue.

If a small quantity of the crystallized acid be placed within a glass ring which is attached to a glass slide, and the latter be gradually heated on an iron plate placed over a Bunsen burner, the acid undergoes no change until heated considerably above 212° F., when it volatilizes without fusion or change of color. If the vapors thus produced be received upon a warmed glass slide or cover placed upon the glass ring, they condense in the form of brilliant, transparent crystals of one or more of the

forms illustrated in plate, figs. 3, 4 and 5, their exact character depending on the relative amount of substance present and the temperature employed. For the success of this experiment it is necessary that only a very minute quantity of the organic acid be employed. The $\frac{1}{100}$ th of a grain of the acid will furnish quite a number of fine crystalline sublimates. Very satisfactory sublimates may be obtained from the acid, even when contaminated with comparatively large quantities of foreign organic matter.

The true nature of the gelseminic acid sublimate may be established by treating it with a drop of water containing a trace of ammonia, when it will dissolve to a solution having the optical properties already described. So, also, its nature may be determined by dissolving it in a small drop of nitric acid and then adding to the yellow solution an excess of ammonia, when a deep or orange-red coloration will manifest itself.

Reactions of Solutions of Gelseminic Acid.—Solutions of the salts of gelseminic acid have a slightly astringent taste and are colorless, excepting an alkali be present, when, as already pointed out, they present a bluish appearance. They are readily decomposed by free acids, with the elimination of the organic acid, which, if the solution contains $\frac{1}{500}$ th or more of its weight of the acid, separates in the form of delicate crystalline needles.

Since the gelseminates of the metals proper are nearly all insoluble in water, the acid is precipitated, from its combinations with an alkali, by solutions of most of the metallic salts, being thrown down in the form of a salt.

1. *Acetate of Lead* throws down from solutions of the acid a yellow amorphous precipitate, which is readily soluble in free acids, even in acetic acid, with the separation of the organic acid. $\frac{1}{100}$ th of a grain of the acid in one grain of water, yields with the reagents a very copious deposit; $\frac{1}{1000}$ th grain gives a very decided precipitate.

2. *Corrosive Sublimate* produces in solution of the acid a yellowish filmy precipitate. After a little time, at least when from tolerably strong solutions, the precipitate becomes partly, at least, converted into colorless crystalline needles, plate, fig. 6, due perhaps to the separation of the organic acid. The pre-

precipitate is readily soluble in free acids, and its nature may be confirmed by addition of excess of nitric acid and then of ammonia.

Nitrate of Suboxide of Mercury also precipitates the acid in the form of a dirty yellow deposit.

3. *Nitrate of Silver* produces in solution of the acid a yellow or brownish-yellow precipitate, which slowly acquires a nearly or altogether black color and is then insoluble in nitric acid. The 1-100th of a grain of the acid yields a very copious precipitate. 1-1000th grain yields at first only a faint turbidity, but in a little time there is a quite copious black or bluish-black precipitate. 1-10,000th grain will yield after some minutes a good black deposit; and after several minutes, one drop of a 50-000th solution of the acid will acquire a distinct purplish or blackish color.

4. *Sulphate of Copper* throws down from tolerably strong solutions of the acid a brownish-red precipitate, which quickly acquires a dull red color, and after a time becomes partly granular and crystalline. The precipitate is readily decomposed by free acids with the elimination of the organic acid.

5. *Sulphate of Iron* produces in solutions of the acid, when not too dilute, a black precipitate which quickly becomes brown, and after a time masses of colorless crystalline needles appear.

6. *Chloride of Gold* occasions a deep green precipitate, quickly becoming bluish and appearing black by reflected light. The precipitate is insoluble in acetic acid. 1-1000th of a grain of the acid yields a good bluish deposit.

7. *Bichloride of Platinum* produces, in strong solutions of the acid, a dirty yellow amorphous precipitate, which is insoluble in acetic acid, and after a time becomes granular.

8. A solution of *bromine in bromohydric acid* throws down from a drop of a 100th solution of the acid a copious greenish precipitate, which quickly acquires a bluish, then a dark grey color. One drop of a 1,000th solution yields a decided green precipitate, which finally acquires a deep blue color.

9. *Iodine* in solution of *Iodide of Potassium* produces in solutions of the acid, when not very dilute, a copious reddish-

brown deposit, which after a time assumes a dark green color. The precipitate is insoluble in acetic acid.

Solutions containing more than 1-100th of their weight of the acid will also yield precipitates with the soluble neutral salts of lime, nickel, cobalt and tin.

II. GELSEMININE.

Preparation.—Gelseminine may be extracted from the concentrated extract from which gelseminic acid has been extracted by ether, by rendering the liquid slightly alkaline with potash, and then repeatedly agitating it with chloroform, which will dissolve the alkaloid together with more or less foreign matter. For this purpose, about two volumes of chloroform may at first be employed, and after this has been separated, the operation repeated with a similar quantity of the fluid, when finally the alkaline solution is washed with about its own volume of the liquid. It sometimes happen, especially if the mixture has been violently agitated for some minutes, that the liquids form an emulsion from which the chloroform does not entirely separate for many hours. The separation may usually be facilitated by moderately warming the mixture and gently agitating it.

The chloroform employed for these extractions is collected in a dish and evaporated at a very moderate temperature, when it will leave a hard, gum-like, yellowish or brownish-yellow residue. This is treated with a small quantity of water and the mixture slightly acidulated with hydrochloric acid, which will dissolve the alkaloid together with more or less foreign matter. This solution is filtered, and the filtrate concentrated to about one-sixteenth the volume of the original fluid extract operated upon. On now treating the concentrated liquid with slight excess of caustic potash, the alkaloid will be precipitated in the form of a more or less white deposit. This is collected on a filter, washed with a small quantity of pure water, then allowed to dry at the ordinary temperature. On drying, the precipitate will shrink greatly in volume and acquire a dark color.

For the purpose of further purifying the alkaloid, the dry mass is pulverized and the brownish powder dissolved, by the aid of a few drops of hydrochloric acid, in a small quantity of

water, from which it is re-precipitated by slight excess of caustic potash and then extracted from the mixture by ether, which, on spontaneous evaporation, will leave it in the form of a very hard, brittle, transparent mass, strongly adhering to the watch-glass or other vessel in which the evaporation was effected. On carefully detaching the residue and pulverising it, it will form a nearly or altogether colorless powder. If the powder is still colored, it may be again dissolved and extracted by ether.

Since the alkaloid is not altogether insoluble in water, a very notable quantity will remain in the filtrate from which the precipitate produced by potash was separated. This may be recovered by precipitating it with a solution of iodine in iodide of potassium, collecting and washing the precipitate, then dissolving it in alcohol, and precipitating the iodine by the cautious addition of nitrate of silver, which will throw it down as iodide of silver, whilst the alkaloid will remain in solution in the form of nitrate. The solution is then concentrated to expel the alcohol, diluted with water, filtered, and the filtrate evaporated at a moderate temperature, when the nitrate will be left in its pure state. The alkaloid may readily be recovered from the nitrate by dissolving it in water, adding slight excess of a free alkali, and then extracting the liberated base by ether or chloroform.

Instead of employing the foregoing method for the recovery of the alkaloid from the above filtrate, the liquid may be slightly acidulated, then concentrated to a small volume, again rendered alkaline, and the alkaloid extracted directly by ether. To obtain it pure by this method, however, will require at least a second extraction with ether.

In regard to the proportion of the alkaloid present in the fluid extract of gelsemium, we obtained, as the average of several experiments, about 3.20 grains of the purified base from eight fluid ounces of the extract examined. Since a fluid ounce of the extract weighs about 450 grains, it would thus appear that it contains about 1-1100th of its weight of the alkaloid, or about one grain in two and a half fluid ounces. Doubtless a notable quantity of the base was lost in the repeated purifications. That the extract as found in commerce is uniform in strength, we are not prepared to state.

Physiological effects.—That this alkaloid is a very active and powerful poison, is shown by the following experiments. One-tenth of a grain, in the form of chloride and dissolved in a small quantity of water, was administered to a strong healthy cat. Immediately it caused extreme frothing from the mouth, and in twenty minutes the animal exhibited great weakness of the extremities, walking with much uncertainty. In forty minutes there was extreme prostration with entire inability to walk and the uttering of plaintive cries. In one hour the prostration was even more complete. When seen six hours after the poison had been administered, the animal appeared comparatively well, but walked with a very uncertain gait. There is little doubt but more or less of the poison was expelled from the mouth by the excessive frothing.

Three days afterwards one-eighth of a grain was administered to the same animal by hypodermic injection, the animal in the meantime having apparently entirely recovered from the former dose, and being well fed. In about fifteen minutes the animal exhibited great distress, manifested by sudden changes of position, moaning, etc. In forty minutes there was great prostration and great difficulty in moving, the legs giving way, and progression being about as often backwards as forwards; the pulse was 230, and very feeble; respiration greatly reduced and gasping; the pupils dilated to their fullest extent. These symptoms continued, and death took place in one hour and a half after the poison had been administered, without there being at any time convulsions.

Chemical properties.—In its pure state, gelseminine is a colorless, odorless solid, having an intensely persistent bitter taste. Thus far we have failed to obtain it in the form of well-defined crystals. It has strongly basic properties, completely neutralising the most powerful acids, forming salts, of which the sulphate, nitrate, chloride and acetate are freely soluble in water.*

In its free state, the alkaloid is only sparingly soluble in water, requiring several hundred times its weight for solution;

* We have not yet satisfactorily determined the ultimate composition of gelseminine, but hope soon to report its exact composition, together with that of gelseminic acid.

but it is very freely soluble both in chloroform and in ether; one part of the alkaloid immediately enters into solution when agitated with twenty-five parts of the latter liquid.

If a drop of *concentrated sulphuric acid* be added to a small quantity of gelseminine, or of any of its colorless salts, it causes it to assume a reddish-brown color, and dissolves it to a reddish-colored solution. If this solution be *moderately heated*, it acquires a beautiful purple color. This coloration manifests itself from 1-100th of a grain of the alkaloid. Bichromate of potash stirred in the sulphuric acid solution of the base, produces no marked change.

Nitric acid readily dissolves the alkaloid, under the production of a greenish color, to a greenish or greenish-yellow solution.

Hydrochloric acid dissolves it with a yellow coloration to a colorless or faintly yellow solution.

Caustic potash has little or no effect upon the dry powder.

At a temperature somewhat below 212° F., gelseminine fuses to a colorless viscid liquid, which on cooling solidifies to a transparent vitreous mass. At a higher temperature the alkaloid is dissipated, without residue, in the form of white fumes. If these vapors be received on a warmed piece of glass, they condense in the form of minute drops.

Reactions of solutions of gelseminine.—Solutions of the salts of gelseminine, when pure, are nearly or altogether colorless, and have the peculiar bitter taste of the alkaloid. This bitter taste is well marked in a single drop of a 1000th solution of the base.

1. *Potash*, as well as the other caustic alkalies, precipitates the alkaloid from tolerably strong solutions of its salts, in the form of a white amorphous deposit, which is insoluble in excess of the precipitant. One drop of a 100th solution of the base yields a rather copious flocculent precipitate. After some hours the precipitate acquires a reddish or brick-red color.

2. *Bichromate of potash* throws down from solutions of salts of the alkaloid, when not too dilute, a copious yellow amorphous precipitate, which is slowly soluble in acetic acid.

3. *Carbazotic acid* produces a yellow amorphous precipitate. 1-100th of a grain of the alkaloid, in one grain of fluid, yields a very copious, bright yellow deposit; 1-1000th grain yields a greenish-yellow deposit.

4. *Iodine* in a solution of *iodide of potassium* throws down from solutions of salts of the alkaloid a brown precipitate, which is only sparingly soluble in acetic acid. 1-100th of a grain yields a very copious precipitate; 1-1000th of a grain, a good chocolate-colored deposit; 1-10,000 of a grain, a very distinct deposit.

5. *Bromine* in *bromohydric acid* precipitates the alkaloid from solutions of its salts in the form of a yellowish amorphous deposit. 1-100th of a grain in one grain of water yields a copious flesh-colored precipitate, which becomes yellow. 1-1000th grain yields a very good yellow flocculent deposit; 1-5000 grain, a very distinct precipitate.

6. *Chloride of gold* produces a yellow amorphous precipitate, which dissolves with difficulty in acetic acid. 1-100th of a grain yields a very copious precipitate; 1-1000th grain yields a good flocculent deposit.

7. *Bichloride of platinum* occasions a light yellow precipitate, which still manifests itself in one grain of a 1-1000th solution.

8. *Sulphocyanide of potassium* produces, in tolerably strong solutions of the chloride of the alkaloid, a dirty-white precipitate, in which, after a time, brownish or chocolate-colored flakes usually appear.

9. *Ferricyanide of potassium* throws down from concentrated solutions of the chloride a dirty-greenish or bluish-green precipitate, the green color of which after a time becomes more marked.

10. *Corrosive sublimate* occasions a white precipitate, which is only sparingly soluble in large excess of hydrochloric acid. 1-100th of a grain yields a very copious precipitate; 1-500th grain, a quite distinct turbidity.

Concentrated solutions of the salts of the alkaloid also yield precipitates, of a dirty-white color, with iodide of potassium and with ferrocyanide of potassium.

From the above it will be observed that the reactions of gelseminine are by no means so characteristic nor delicate as those of gelseminic acid. In poisoning by the fluid extract of gelsemium it might therefore happen that the acid would be discovered, whilst there would be a failure to satisfactorily prove the presence of the base.

III. CASE OF POISONING BY FLUID EXTRACT GELSEMIUM.

Symptoms.—In regard to the case of poisoning by this substance, heretofore mentioned, the particulars, as we understand them, were briefly as follows. On the 30th of January last, three teaspoonfuls of the fluid extract were administered to a young healthy married woman several weeks advanced in pregnancy, who at the time complained of no serious illness. In two hours after taking the dose, the patient complained of pain in the stomach, nausea, and dimness of vision. These symptoms were soon succeeded with great restlessness, ineffectual efforts to vomit, and free perspiration over the body. At the expiration of about five hours the pulse was found feeble, irregular, and sometimes intermittent; there was great prostration, with irregular breathing and slow respiration. The skin was dry; extremities cold; the pupils expanded and insensible to light; the eyes fixed and inability to raise the eye-lids. The vital powers rapidly gave way, and, without convulsions, death occurred in about seven hours and a half after the poison had been taken.

It will be observed that in this case, only three teaspoonsful of the fluid extract were taken. Presuming it to have had about the same strength as the preparation we examined, the quantity of the alkaloid contained in this amount could not have much exceeded the sixth-part of a grain. This would seem to indicate the alkaloid to be one of the most potent poisons at present known.

Post-Mortem Appearances.—Eight days after death the body presented the following appearances, as described by Dr. J. H. Stephenson, who made the autopsy and to whom I am indebted for the account. Countenance natural as in sleep. No emaciation, and body in a perfect state of preservation. Cadaveric rigidity very slight. The back of the neck and between the shoulders, extending the full length of the spine, as also the depending parts of the thighs and arms to the elbows, presented a congested appearance. The membranes and substances of the brain and medulla oblongata were normal. The adipose tissue remarkably thick, and highly tinged throughout with bilious matter. Lungs slightly collapsed, natural in appearance, and

superficial veins congested. Heart normal in size, superficial veins injected, and the cavities greatly distended with dark grumous blood, inside of which was found a well-defined membrane, identical in appearance with that found in diphtheria and pseudo-membranous croup. The abdomen presented no tympanitic distention. Stomach slightly distended with gas, and contained a small quantity of ingesta. Peritoneum and intestines in a healthy condition. Liver and investing membrane normal; left kidney congested. The uterus was slightly enlarged and contained a fœtus of about five weeks' development.

A small quantity of the contents of the stomach having escaped from the organ at the time of the dissection, was collected separately in a small bottle; the stomach with the balance of its contents was placed in a larger bottle. These bottles, with their contents, were carefully sealed and remained undisturbed until the 17th of May. At this time the contents of the bottle containing the stomach were found to have undergone considerable decomposition. A little pure alcohol was added to the decomposing mass, and it then allowed to remain until the 13th of June, when the chemical examination of the contents of both bottles was commenced.

Chemical Analysis.—The contents of the *small bottle*, consisting of about two fluid drachms of liquid with a small amount of solid matter, were digested with about one ounce of strong alcohol, the liquid then decanted, and the solids washed with fresh alcohol, which was collected with that first employed. The alcoholic liquid was now concentrated at a moderate temperature to about one-half its volume, then filtered, and the filtrate concentrated to about one drachm of fluid. This concentration caused the separation of some oily globules, and also of some apparently vegetable solid matter, and the mixture exhaled a very marked vegetable odor, very similar to that of the extract of gelsemium under similar conditions.

The concentrated liquid thus obtained was again treated with alcohol, filtered, and the concentrated filtrate treated with about half an ounce of pure water, which left considerable matter undissolved, and furnished, when filtered, a clear slightly yellowish solution. This aqueous solution was concentrated to a small

volume, filtered, the filtrate acidulated with a few drops of acetic acid and then extracted with two volumes of pure commercial ether. On allowing the ethereal liquid to evaporate spontaneously, it left a nearly colorless residue containing several groups of crystals, similar in appearance to those of gelseminic acid.

A portion of this residue, when examined in its solid state by nitric acid and ammonia, and another portion when dissolved by the aid of an alkali and the solution tested by several reagents, presented the chemical and fluorescent properties of gelseminic acid in a degree indicating the presence of a very notable quantity of the acid. The contents of the small bottle were not examined for the alkaloid.

The contents of the *stomach* were treated and purified after the general method described above, and the final aqueous solution acidulated with acetic acid and extracted with ether, for the purpose of recovering the organic acid, if present; the solution thus extracted was then rendered slightly alkaline and extracted by chloroform, for the purpose of recovering the alkaloid. The purified ether extract revealed very satisfactory evidence of the presence of the organic acid, both in regard to its fluorescent and chemical properties. So, also, the chloroform extract, when purified and the final aqueous solution concentrated to a very small volume and examined by several reagents, furnished undoubted evidence of the presence of the base, indicating it, however, to be present only in very minute quantity.

On comparing the intensities of the reactions of the several reagents applied with those obtained by the same reagents from solutions of the alkaloid of known strength, it was inferred that the quantity of the base recovered in this case did not much, if any, exceed the fiftieth part of a grain. The quantity of the alkaloid originally taken, as we have already seen, did not probably much exceed the sixth of a grain.

The fact that the stomach with its contents had undergone considerable decomposition, and also that the chemical examination was not made until some months after death, would seem to indicate that the poison is not readily destroyed by decomposition, and that it may be recovered after comparatively long periods, even when taken only in small quantity.

COLUMBUS, OHIO, Nov. 15, 1869.

A SUPPLEMENT TO CAMPBELL'S METHOD OF PERCOLATION FOR FLUID EXTRACTS.

BY SAMUEL CAMPBELL, of Philadelphia.

TO THE EDITOR :

In the September number of the American Journal of Pharmacy, I published an article entitled "a new and simple process for fluid extracts, by which any drug may be exhausted by percolation and without heat," and as I learn that there seems to be some misunderstanding regarding the minutiae of the method proposed, I herewith take the liberty of presenting to you for publication a second paper, on the same subject, embracing an analysis of each step of the process, with a classification of a list of the fluid extracts made by this method in a series of experiments made by myself. The subject is an important one, and one that is worthy the attention of the revisers of the Pharmacopœia, recommending itself by its simplicity of manipulation and formula, involving no expense by waste, nor outlay of means for vessels, or stills, wherewith to recover alcohol, and requiring only ordinary care and skill to make a perfect fluid extract. It also leaves the retail pharmacist without excuse in not making the fluid extracts himself, in preference to buying them from the manufacturer, as, by this method, he may prepare as small a quantity as four fluid ounces, or as large a quantity as desired; as I experienced better success in making five pints than in making a half pint, the smaller quantity requiring more careful manipulation than the larger, a point which will recommend itself to the manufacturing pharmacist. The first step in the process is to obtain a powder of the proper degree of fineness, a point upon which there seems to be a difference of opinion among pharmacutists; some maintaining that it is not necessary to have a fine or very fine powder for purposes of percolation; others taking the contrary view, that a powder cannot be too fine. In my opinion, much harm has been done by the advocates of extremely fine powders, as it has a tendency to throw the whole business of making officinal fluid extracts into the hands of the manufacturers, or compels the conscientious retailer, who prefers to make

his own preparations, to depend upon the wholesale dealer, or grinder of drugs, as to the purity of his powders, it being almost impossible for him to powder them in his own laboratory, as it involves so much time and labor as to make the products cost him more than he can buy them of the large manufacturer, and as a consequence he cannot compete with his rival or neighboring store. Take, for instance, *nux vomica*, or *pareira brava*, or gentian root, or buchu leaves, and what facilities are there in any retail drug store to reduce any one of these substances to a powder, in accordance with the official grade of fineness, without he is willing and able to spend two or three days over a drug mill, or pestle and mortar. Another objection to a fine or very fine powder, is a fact that I have always observed, in dampening the powder previous to packing in the percolator, which is the formation of small pellets all through the mass, caused by the agglutination of the dusty or finer particles of the powder the moment the moistening liquid reaches it; and it is almost impossible to avoid such a result, the only method being to use a large amount of liquid, so as to form a pasty mass, which then becomes impracticable for packing solidly, and, in all such cases, an imperfect percolation is the consequence. In my method I have adopted the grade of powder known as moderately coarse. Arriving at such a conclusion, after having made a novel yet interesting series of experiments, which I shall designate as the analysis of moderately coarse powders, I selected twenty different drugs, and after grinding twice, alternately through a Swift's drug mill, and sieving, and then contusing in a pestle and mortar until the whole had passed through a No. 40 sieve, I found that three-fourths of the whole quantity, in almost every instance, would pass through sieve No. 50, known as moderately fine, more than one-half through sieve No. 60, known as fine, and one-third, and in a majority of cases nearly one-half, through No. 80, known as very fine, leaving, on an aggregate, a balance of only one-fourth of the whole quantity of the grade No. 40. Hence, I deemed it an absurdity and a waste of time and labor for any further reduction in the fineness of the powders. And the practicability of the idea was evidenced by the success in the almost entire exhaustion of upwards of

60 different drugs, as the range of my field of experiment. Having procured a powder moderately coarse, the next step is to mix the proper menstruum in the proportion of sixteen fluid ounces for every sixteen troy ounces of the powder to be percolated, preparatory to the next step of the process, which is to dampen the powder. I find that four fluid-ounces of the prepared menstruum is quite sufficient to dampen sixteen troy ounces of the powder, unless the drug is unusually bulky, and then six fluid ounces is enough. And in dampening the powder the liquid should be thoroughly incorporated by being well rubbed uniformly through the powder, so as to avoid any agglutination of the finer particles, or the formation of small pellets. It is a practical error to have the powder wet by using the whole of the menstruum, more especially in this method, as the object aimed at is to combine both maceration and percolation slowly during the four days of rest, and if the process is conducted in a glass funnel, it will be observed, at the end of four days, that the active soluble matter of the drug has percolated, or settled in the bottom of the funnel, leaving the upper layer, or at least one-third of the packed drug, tasteless; consequently it is more easily forced through by the displacing liquid. Having dampened the powder as above, the next step is to proceed to pack it, uniformly and moderately tight, in the percolator. Having previously placed a piece of sponge in the neck of the percolator or funnel, moistened with the menstruum, then cover over the surface of the drug a disc of paper and proceed to pour on the remaining twelve fluid ounces of menstruum, allowing it to be slowly absorbed or percolated through the packed drug. When the liquid is observed to begin to saturate the piece of sponge in the bottom of the funnel, place a cork tightly in the orifice of the neck of the funnel and allow the whole to macerate four days. At the end of that time remove the cork, and pour over the surface of the drug in the funnel a displacing liquid corresponding to the menstruum used, omitting glycerin, as, for instance, if the menstruum was alcohol and glycerin, let the displacing liquid be strong alcohol; if alcohol, water and glycerin, use for displacing liquid dilute alcohol; if water and glycerin (as used for wild cherry bark) use cold water as the displacing

liquid. When sixteen fluid ounces have been obtained the process is finished, and in every experiment the result far exceeded in odor, taste and appearance the product resulting from the usual method. In a number of the experiments I observed that, after obtaining the first sixteen fluid ounces, and then continuing the percolation to the extent of two or four ounces more, the last percolate was charged with some odor and coloring matter, but upon careful evaporation proved to my mind that it was not worth preserving, nor in any one instance was there a greater loss than one per cent. of active matter, a fact which was practically proven by the experiment of drying the exhausted powder, then redampening and repacking it in the funnel, and again exhausting with alcohol and water, until the menstruum passed colorless, then carefully evaporating to an extract, and weighing; thus giving the accurate loss of soluble matter. As a matter of great accuracy it could be obviated by the suggestions thrown out by Mr. A. B. Taylor, in his criticism on my method before the Pharmaceutical Association, last September, which was to percolate eighteen fluid ounces, then reduce it to sixteen fluid ounces by spontaneous evaporation; this, of course, refers to the alcoholic fluid extracts. Yet I feel assured that, when the process is carefully conducted, and not hurried through, the first sixteen fluid ounces is almost, in fact quite, as near to perfection as it can possibly be made, and know that it will compare much more favorably in regard to the amount of active soluble matter than the present officinal method, as it has always been a source of inquiry to my mind whether the evaporated portion of the officinal formulas contain any remedial properties worth preserving. Also, whether in mixing it with the reserved portion, and filtering after standing, it does not carry with it a portion of the active matter. The use of glycerin as forming part of the menstruum in this method is not intended to conflict with the officinal formulas, but is suggested as an invaluable agent and addition for dissolving out the active matter of drugs, also for its superiority over sugar in preventing the deposition of a portion of the active soluble matter that occurs in almost all of the fluid extracts; and further, from some unfinished experiments, I am inclined to believe that,

in all cases where the active principles of drugs exist with extractive matter, glycerin will supercede all other menstrua. The only doubt existing with me in regard to such an assertion is the want of knowledge as to the capability of glycerin to withstand or arrest fermentation in the presence of vegetable matter, and hope to be able, at some future time, to give the result of such a series of experiments.

The following list comprises all the substances I have experimented with, and the menstruum used :

CLASS No. 1,	Camomile Flowers.
Or Alcoholic Fluid Extracts ;	Belladonna Leaves.
menstruum composed of Al-	Catnip.
cohol, three-fourths ; Gly-	Catechu.
cerin, one-fourth.	Chimaphila.
Aconite Root.	Chirayta.
Buchu Leaves.	Cimicifuga.
Calamus.	Cinchona Calisaya.
Capsicum.	Collinsonia.
Cardamom.	Colombo.
Cascarilla.	Colchicum Root.
Ceylon Cinnamon.	Colchicum Seed.
Cubebs.	Conium Leaves.
Juniper Berries.	Cypripedium.
Lupulin.	Digitalis Leaves.
Nutmegs.	Dulcamara.
Savin.	Ergot.
Sassafras Bark.	Erigeron Canadensis.
Valerian.	Eupatorium.
Ginger.	Galls.
	Gelsemium.
CLASS No. 2,	Gentian Root.
Or Hydro-Alcoholic Fluid Ex-	Geranium.
tracts ; menstruum composed	Helleboris Niger.
of Alcohol, one-half ; Water,	Humulus.
one-fourth ; Glycerin, one-	Hydrastis Canadensis.
fourth.	Hyoscyamus Leaves.
Absinthium.	Ipecacuanha Root.
Aconite Leaves.	Iris Florentina.

Kino.
 Krameria.
 Lactucarium.
 Lobelia Leaves.
 Marrubium.
 Pareira Brava.
 Quassia.
 Quercus Alba.
 Rhubarb Root.
 Rubus Villosus.
 Sarsaparilla.
 Senega.
 Senna.

Serpentaria.
 Spigelia.
 Stillingia.
 Taraxacum.
 Uva Ursi.

CLASS No. 3,

Menstruum composed of equal
 parts of Glycerin and Water.
 Wild Cherry Bark.
 Liquorice Root.
 Coffee (Java.)

The subject is one of interest to the profession at large, and I will hail with pleasure the criticisms of any or all whom it interests, involving, as it does, a complete revolution in the various pharmaceutical formulas of all our standard authorities.

Nov. 10th, 1869.

THE DRUG BUSINESS IN SWEDEN.

BY OSCAR OLDBERG.

The number of drug stores in Sweden is limited by virtue of the control that the Royal Board of Health exercises over them. Formerly the privilege of practicing the pharmaceutical profession and selling drugs was granted by the King alone, on the recommendation of the Board, to persons considered competent chemists and pharmacutists. These licenses were transferable, and hence all *old* drug stores in Sweden can be bought by any one who has fulfilled all the requirements of law and established his competency. The licenses to hold and conduct these stores are generally worth three times the value of the stock and fixtures.

But the licenses of all *new* drug stores are of an entirely different character—being granted to the pharmacutists only for their lifetime, with which they expire. New license is tendered to the next happy aspirant when a druggist holding such non-transferable license dies.

The number of pharmaceutical establishments in Sweden being extremely small in comparison to what it is in this country, it follows that licenses are there very valuable, although by no means in the same proportion. A city of about 5000 inhabitants, with an additional 20,000 of people living all around it, may have only one drug store. In the United States I have heard of two such shops in a place with only a few hundred residents. To be sure, populations of such little embryos of future great cities in America grow at such a marvellous rate, that it is almost justifiable to put up one pharmacy for every 500 people, or two such for every one bank and newspaper.

But, as for Sweden, let us go through a regular apprenticeship there and rise by degrees—on paper—up to the eminence of a happy established boss.

Master A., 16 years of age, is rather a smart boy, and his father wishes to make something great out of him. But money is tight, and Master A.'s brother needs all that papa can spare for the completion of his studies at the University. What is to be done? Why, send the youth to a drug store,—of course. He has spent six years at the high school and is tolerably well posted in Latin, German and botany, etc., so he has all the requisites of qualification prescribed by law.

His father is either a country parson or something else. His mother having supplied him with a half dozen new shirts, a dozen pair of stockings, etc., etc., and his whole wardrobe having been inspected and reconstructed, Master A.'s trunk is packed, and, after an affectionate leave-taking from his home and folks, off he starts toward an unknown fate.

With all the money his father can possibly spare in his pocket-book, just a grain of uncertain fear in his heart, and a good pound of curiosity in his head, he at last reaches his place of destination. The store is one of the most prominent corners in the city; outside, over the door, a swan, a lion, an owl, an angel, a dragon, a deer, a unicorn, a crown or some other wonderful thing—the trade mark and name of the establishment. Inside, he finds himself puzzled out of his concepts altogether. The store-room is large; in the middle of it is a large counter, having a low railing along its outer edge, and

behind it stand two or three or four gentlemen, weighing and mixing and rubbing and pouring and writing with a remarkable speed. One makes pills and powders, another mixtures and liniments, and a third-one plasters and ointments, and so on. Behind the long counter on one side are two young men running about with scales in their hands waiting on a dozen customers. On the shelves around the walls is an astonishingly great number of bottles, and below the shelves long rows of drawers.

"Is the apothecary in, sir?"

"Yes sir. Anything particular?"

"Well, I am going to—to be an apprentice here."

"Oh yes! Walk into the back room."

Master A. goes behind the counter for the first time in his life, and marches on into another large room, which he thinks is another drug store. At last, after waiting an hour or two, he hears the approaching steps of the proprietor of all that.

"Ah, good day my boy. How is your father? Come along in here, I want to talk to you."

Oh, what an awful man he is though!!

The boy is engaged to stay four years in the store, during which time he receives for his services board, lodging and instruction. During the first year he cleanses bottles and mortars and all sorts of vessels and implements, waits on customers when he can get a chance to, and makes up his mind that he is the most unfortunate wretch in creation. The second year he feels a little easier, because, then Master B. comes in the store to take his place, through which notable event he is raised one step in advance, and has the sweet satisfaction to know that somebody is under him, any how. But still he is by no means enthusiastic about his learned profession. The third year he knows how to make a pill mass well, can spread a first rate plaster, make decoctions and infusions, and seldom washes any more mortars. The fourth year he is first apprentice, has a chance to put up a prescription or two a day, under the supervision of the prescription clerks, when they are busy or have something too troublesome. He goes into the laboratory back in the yard and helps the manufacturing chemists—aye, he is toward the end of his term

of apprenticeship trusted even so far as to be allowed to cook adhesive plaster on his own hook. He has now leisure hours which he can devote to study, and he knows more about the customers, the store, the magazines, the laboratory, the garrets and the cellars than any one else connected with the place.

Finally his employer finds it impossible to keep him any longer as an apprentice, without being looked upon as a tyrant; he apprehends that Mr. A. won't wait much longer before his patience is used up, and at last he consents to let him graduate. Doctor C. and D. and E. and F. are requested to come and examine the young student and to dine with his employer. At the examination one of the clerks officiates as Secretary, and writes down every question that is put to the poor fellow, together with the answers given by him. Master A. exhibits a row of bottles containing samples of chemical and pharmaceutical preparations made by himself, and as he goes through the mill they sift him quite severely sometimes. If he can satisfy his examiners, they sign the "protocollum," and it is sent, together with a certificate from the employers, to the Royal Board of Health.

After due consideration *of* and deliberation *on* the subject, that body issues his diploma and requests the young graduate to take the oath of allegiance and office. This done, he is a "pharmaciae studiosus," and can put up a prescription or distil spirits of nitre on his own responsibility. He receives salary now, and is a professional man.

One of the manufacturing chemists is going to take his place at the prescription counter instead of Mr. L., who had the good luck to be appointed druggist at Y., the other day, and young Mr. A. fills the vacancy in the laboratory for a couple of years. Then, if he can raise the money, he goes to Stockholm and gets his name entered on the list of candidates for admission to the College of Pharmacy. He is subjected to another examination and, if he successfully passes it, admitted. At the college he reads this book and that book and the other book, too, and makes all sorts of complicated preparations and chemical experiments, and after two or three years he is ready for his "tentamina" in the different subjects. These tentamina are, thank God, his last

examinations, and, after having passed, he gets another diploma from the Royal Board of Health, takes another oath of office and is called an apothecary.

But where is he going to get a drug store from? He has no money, and it would not help him much if he had a rich uncle to supply him with that most useful article either, for he must, according to law, serve four years more first. Well, well, he serves. He is now 29 or 30 years of age, and has not been able to save much from his rather small salary, but he wants a drug store to be sure.

His uncle could buy him one now—one of those old establishments with transferable licenses; but ten chances to one he hasn't got a rich uncle.

By and by the proprietor of one of the newer drug stores dies, and the place is advertised vacant. There is at last one-tenth or twentieth part of a chance. He sends in his application with all the others, and in due time is notified, through the *Journal of Pharmacy*, that Mr. R., who is 50 years of age, and has been standing behind the prescription counter till he has ruptures of blood vessels in both legs, got the nomination from the Board of Health, and was confirmed by the King. Or if he is unusually fortunate and particularly skilled in his profession, and his competitors are less so, he gets the appointment and borrows money to buy the stock and fixtures with from the widow of his predecessor. Once well established, he devotes the balance of his lifetime to first pay his debts, and then, if there is any time left, make money.

We have in Sweden a good many excellent pharmacutists dying from old age before they have the satisfaction to see a store of their own. Some emigrate to America, Africa and Asia, before it is too late.

The Royal Board of Health is the bugbear for the druggists. They instituted a regular annual visitation in each store by the provincial physicians, and besides, made a surprise call occasionally. At these visitations the store was searched through, and sundry chemicals and preparations tested, the visiting physician or professor looked after, that the druggist did not charge more for his drugs or prescriptions than the annual price

list issued by the Board allowed, and the poisons were particularly taken notice of.

In Sweden all poisons are kept in one closet, separated from all other medicines, and they are locked up. No one except the graduated pharmacist has access to the poison closet.

The poisons are divided into six classes :

1st. Preparations of opium and lactucarium.

2d. “ “ antimony and emetia.

3d. “ “ mercury and lead.

4th. “ “ nux vomica, elaterium, veratria, euphorbium and croton oil.

5th. “ “ arsenic and phosphorus.

6th. “ “ prussic acid, chloroform, belladonna, hyoscyamus, digitalis, stramonium, conium, aconite and ergot, etc.

The closet was divided off into six compartments, each one painted with its own distinct color. In these compartments the different classes of poisons were put.

1st. Class,	.	.	.	blue.
2d. “	.	.	.	red.
3d. “	.	.	.	yellow.
4th. “	.	.	.	green.
5th. “	.	.	.	black.
6th. “	.	.	.	white.

The labels on the poison phials had the same color as the shelf to which they belonged, and the bottles of all classes had a characteristic mark (φ) common to all. The labels on arsenic and phosphorus being black, they had white lettering.

This arrangement prevented every possibility of mistake, for if one of these bottles, with a colored label and the poison mark on it, should stand among a hundred others, it would still be immediately recognized and never touched. And the classification effectually guards against mistakes between the different poisons themselves.

No poison was ever sold except on prescription from a regular physician, and arsenic only when the buyer signed an acknowledgement of the receipt of it on the back of that prescription. The entire stock of arsenic on hand at the annual visitation by

the physician of the district was carefully weighed, and then the phials containing it sealed up. At the next visitation it was weighed again, and the druggist requested to show the original prescriptions for the arsenic missing. When no arsenic had been sold, the seals were of course not disturbed. A journal was also kept, in which account was kept of all arsenic bought and sold.

All prescriptions for the least quantity of any remedial agent, which belonged to the poison closet, were kept by the druggist and never renewed, except on special order from the physician. For instance, a mixture containing one grain of extract of hyoseyamus to four ounces of some innocent cough syrup could not, according to law, be renewed. All other prescriptions for non-poisonous preparations were invariably returned to the customers. When furnishing a prescription, the preparer of it was obliged to mark down on it the price of each separate article entering into its composition, and then the cost of labor, bottle and capping and label beside; this long column of numbers was then summed up, and the figurer put his name under the sum, and was thus responsible for its correctness, as well as for the preparation itself. Here are samples of the valuation of prescriptions:

R 4 Extr. hyoseyami, gr. vj.	1 R Sulph. zinci, gr. x.
6 Aquæ fœniculi, ʒij.	2 Aquæ destillat. ʒviij.
4 sol. Solve. adde.	4 sol.
8 Syrup. althææ.	4 capp. m. f. sol.
24 Decoct. senegæ, aa. ʒi.	12 phial.
4 capping, cork and label.	—
9 phial.	23 ore. X. Y. Z.
—	
59 ore.	X. Y. Z.

R 1 Pulv. nitrat. kalic. gr. v.	
1 " rad. ipecac. gr. j.	
3 " opii depurat. gr. ss.	
7 mixing.	
6 powd. papers, m. f. pulv. dr. tal. doses, No. vj.	
—	
18 ore.	X. Y. Z.

One American cent is about equal to three Swedish ores.

All this certainly secures unparalleled safety and an excellent corps of apothecaries, but the total absence of all competition is damaging to the practical science itself. Why, there is hardly any progress at all in pharmacy, and however book-learned, however keen chemists the druggists of old Sweden are—they are slow in many respects. I see, for instance, in the new edition of their Pharmacopœia, and hear from my cousin, who has lately been engaged in one of the largest drug stores there, that they know nothing as yet about percolation, fluid extracts, the modern resinoids, our elegant American elixirs and glyceroles, granules and sugar-coated pills.

On the other hand, they have now adopted the French gramme weight; they know by heart the equivalent of an element to a fraction, and can make pills as round as the very best shot in double quick time.

It is unreasonable to expect more as long as there is no competition. Why not allow every druggist who has “served his time” and got his diploma to put up his shingle and make nauseous pills? I am confident that the disagreeableness of their pills would vanish soon enough, and by and by they would even have them sugar-coated. This will never be accomplished under the present system. In my humble opinion, the system in Sweden and the United States are the extremes. Grant no licenses to unqualified persons, but do grant them to all who have thoroughly studied their profession, and I think we will be better off in every respect.

Washington, D. C., Nov., 1869.

ON MR. CAMPBELL'S PROCESS FOR PREPARING FLUID EXTRACTS.

BY JAMES T. KING.

The changes in the process of preparing fluid extracts, suggested by Mr. Samuel Campbell in the Sept. No. of the Journal, appeared well worth a trial, as the objects aimed to be reached are important, viz., avoiding the use of heat, and saving alcohol. But it appeared to me that the process was not applicable to all drugs, or rather, that some of the drugs specified in the

hydro-alcoholic class would not yield all their active principle, in sixteen fluid ounces of percolate from sixteen troy ounces of the drug.

Rhubarb was taken for the experiment. The root was powdered in a Swift's drug-mill and passed through a sieve of forty meshes to the linear inch, until sixteen troy ounces were obtained; this was moistened with a menstruum composed of two parts alcohol, one part water and one part glycerin, three fluid ounces being sufficient. It was then carefully packed in a funnel prepared for percolation, the surface covered with a piece of filtering paper, and thirteen fluid ounces of the menstruum above described poured over it.

Twenty-four hours showed that the sixteen ounces of liquid used was not sufficient to descend through the powder.

Finding that the menstruum was all absorbed and its descent stopped, sufficient dilute alcohol was added, after the expiration of thirty-six hours, to uniformly moisten the drug. Six ounces more were required—the sixteen troy ounces of rhubarb requiring twenty-two ounces of liquid.

After macerating for the length of time specified by Mr. C., dilute alcohol was added until sixteen ounces of percolate were obtained. This was a dark strong extract of rhubarb, but the drug was not exhausted, eight ounces more being required.

The result of the experiment agrees nearly with those of Mr. Reynolds, reported in the Nov. No. of the Journal.

The suggestion to allow maceration for several days before percolating is a good one, as less menstruum will be required for the complete exhaustion of the drug.

Middletown, N. Y., Dec., 1869.

PHARMACEUTICAL NOTES.

By WM. SILVER THOMPSON.

Vallet's Protocarbonate of Iron.

In the U. S. Pharmacopœia of 1860 this preparation is called "Pills of Carbonate of Iron." This was probably an oversight on the part of the framers of that work, as it does not direct the mass to be made into pills.

After considerable experience in making this preparation, the firm of which the writer is a member has found it advisable to depart in some respects from the officinal formula, and by doing so have produced a more stable preparation, which is but slightly hygroscopic, and is always ready to be formed into pills of firm consistence. Our formula is as follows :

Take of Protosulphate of Iron, 8 ounces ;
Bicarbonate of Soda, 6 ounces ;
Sugar, in fine powder, $4\frac{1}{2}$ ounces ;
Clarified Honey, $\frac{1}{2}$ ounce ;
Syrup, a sufficient quantity ;
Water, a sufficient quantity.

Dissolve each salt separately in a sufficient quantity of water, and add the soda solution to the iron solution gradually, constantly stirring until the effervescence ceases, when add about a fluid-ounce of syrup, and again stir. After the carbonate of iron has subsided, draw off the supernatant liquid and repeat the washing with cold water slightly sweetened with syrup, until the washings are free from saline taste, when, having again drawn off the supernatant liquid, transfer the precipitate to a muslin cloth, and express as much of the water as possible.

To the precipitate, in a porcelain dish placed over a water-bath, add the honey and sugar, and with frequent stirring evaporate to the pilular consistence.

Prepared as above the mass is of fine consistence, of light color, and contains a large proportion of carbonic acid, which may be shown upon the addition of a few drops of diluted sulphuric acid to a small portion.

Syrup of Bromide of Iron.

The following formula, with careful manipulation, will furnish a satisfactory preparation :

Take of Bromine, 9 drachms ;
Card Teeth, $4\frac{1}{2}$ drachms ;
Sugar, 10 troy ounces ;
Water, a sufficient quantity.

To the bromine add five fluidounces of water in a flask of the

capacity of at least a pint, add the card teeth in small portions at a time as the action progresses, having previously placed the flask in a sand bath.

Insert into the mouth of the flask a tuft of card teeth moistened with water, to arrest and prevent the escape of a portion of the bromine should the action become violent.

When the action has ceased, heat the solution of bromide of iron containing the remaining or undissolved portion of the card teeth to the boiling point, and filter through paper into a bottle containing the sugar, marked to the measure of a pint.

Wash the undissolved card teeth with a small portion of water, and add the washing to the contents of the bottle through the filter, followed with sufficient water to make a pint of syrup. This syrup contains nearly a drachm of the salt to each fluid-ounce.

Syrup of Hypophosphite of Iron.

Take of Hypophosphite of Lime, 256 grains;
Protosulphate of Iron, 493 grains;
Sugar, 10 troy-ounces;
Hypophosphorous Acid, a sufficient quantity;
Water, a sufficient quantity.

Dissolve the hypophosphite of lime in four fluid-ounces of boiling water, and acidulate the solution with hypophosphorous acid.

Dissolve the protosulphate of iron in four fluid-ounces of boiling water, mix it with the lime solution, and set the mixture aside for two or three hours. When the reaction has ceased and the sulphate of lime formed has subsided, decant the clear iron solution and pour it into a bottle containing the sugar, marked to the measure of a pint, and add water sufficient to make a pint of syrup. When the sugar is dissolved, after occasional agitation transfer the syrup to small vials and cork tightly.

Each fluid-ounce of this syrup contains sixteen grains of ferrous hypophosphite.

Baltimore, Md., November, 1869.

LIQUOR OPII COMPOSITUS. (COMPOUND SOLUTION OF OPIUM).

BY EDWARD R. QUIBB, M.D.

In the early part of 1859 the writer of this note completed a design previously formed and less definitely executed, of offering for general medical use a liquid preparation containing only the useful anodyne and hypnotic constituents of opium, and of uniform strength.

The design originated in a desire to improve upon the advantages of the "opium titré" or assayed opium of French pharmacy, and to imitate, with improvement, if might be, some of the advantages claimed for the nostrums known as Battley's "liquor opii sedativus," and McMunn's "elixir of opium."

Such a preparation was made, and, under the name of liquor opii compositus, was placed in the hands of several physicians who were supposed to be intelligent close observers, and who had been long familiar with the various preparations of opium and their effects in use. These trials, though not very numerous, resulted in the main so favorably that, after continuing them through the year 1859, a paper was prepared upon "opium as a therapeutic agent," containing a minutely detailed practical working formula for the preparation of liquor opii compositus, and strongly recommending it for trial in general use, and for introduction into the then approaching revision of the U. S. Pharmacopœia, if it should sustain its promised useful character. This paper was published in this Journal for March, 1860, and may be found in Vol. VIII of the third series (Vol. 32, whole number), at pages 115 and 120 et seq. The preparation was not advertised nor pushed in any way, either publicly or privately, but was simply announced for sale on the writer's price-lists, with a recommendation for trial, and was allowed to make its own reputation, and seek its own level of value. In 1862 it had been much more extensively tried, but was refused admission to the Pharmacopœia by the Committee of Revision,—the Committee adopting instead of it the present formula for tinctura opii deodorata. With this latter preparation it was at once put in fair open competition, the two preparations being offered side

by side, with a fair statement that one had been rejected and the other adopted by officinal authority, and with the no inconsiderable inducement of 20 per cent. difference in price in favor of the officinal preparation. Beside, the officinal *tinctura opii deodorata* was always made from assayed opium, and was uniform in strength with the *liquor opii compositus*, with which it was placed in competition. The *Pharmacopœia* does not require the *tinctura opii deodorata* to be made by assay, but this was done to secure the competition against any disadvantage through want of uniformity in strength. The *liquor opii compositus* is always made of the strength indicated in the officinal *tinctura opii*, or *laudanum*, if the *laudanum* be made of good powdered opium as it should be. Such *laudanum* always contains at least four grains of morphia, which is equivalent to about five grains of crystallized sulphate of morphia in each fluidounce. Since 1867 they have been placed side by side upon all the price lists issued by the writer, and until recently with notes fairly setting forth the characteristic points of each. Diligent inquiries have been made in regard to the comparative value of the preparations, and whenever these inquiries have been answered the preference has been given to the compound solution. The sale of both has increased steadily year after year, but the sale of the compound solution has increased much more rapidly than that of the deodorized tincture, and is now more than ten times greater. The regular and steady increase in the demand for the compound solution during the past eleven years having now increased its production in the writer's hands to over eight hundred pounds a year; and the probability that many pharmacists make it for themselves, induces him to undertake a revision of the formula, in order to remove some objections to the present formula, which appear to have been established on good grounds.

The first and principal objection to the present formula is that the odor and taste of ether is disagreeable to most persons, and to many nauseating and hurtful. The increasing use of ether as an anæsthetic, and the nausea, vomiting, and natural disgust produced by it when so used, and the frequent necessity for an anodyne after anæsthesia, renders it of some importance that the anodyne should not contain the agent which has excited the

nausea and disgust, but should rather contain some corrective or corrigent to this tendency to nausea. The compound spirit of ether was used in the preparation chiefly as a preservative agent, to prevent change in the solution, but also to have whatever effect it might, in so small a proportion (3 minims in 24), in favorably modifying the action of the opiate. Dr. Physick and many other excellent authorities had the habit of associating the true Hoffman's anodyne (made with heavy oil of wine) with their opiates, and the habit was confirmed by their observation of the effects obtained. It, however, could not be introduced into the compound solution of opium in sufficient quantity to be very effective, even as an adjuvant, and it is therefore highly probable that its chief agency has been that of a preservative against change in the preparation, and therefore that it might be replaced by some other preserving agent, even if objectionable only in a small proportion of the cases in which it is used, without altering the intrinsic character or value of the preparation.

The second objection to the compound solution of opium was that when long kept in a bottle only partially full, particularly when thus kept in warm climates, or in a warm place in a dispenser's store, it would gradually lose the odor of ether, and assume that of acetic ether. This change was rarely completed in less than two or three years, but numerous instances have been met with where every trace of both ether and heavy oil of wine odor had disappeared. Such specimens, when carefully tried, were found to possess their full original anodyne and hypnotic value, and gave to some good observers the impression or conviction that the acetic ether thus spontaneously generated was an improvement upon that which it replaced. Through watching this suggestion during the past two years, and reading somewhat upon the uses of acetic ether in continental Europe, where it is occasionally prescribed, the conclusion has been reached that even in small quantities it has a pleasant stimulant effect, and that its odor and taste are refreshing and agreeable to a large majority of people, or indeed to almost all. And finally, that if medicinal at all, it is so to nervous susceptible persons, and always in the direction of favorably modifying the well known disagreeable effects of opiates.

These are the two objections that are to be met, and, if possible, removed, in the revision of the formula for compound solution of opium. The much more forcible objection of a complicated formula, and a multiplicity of detail involving sufficient knowledge and skill to make a correct opium assay, can only be met by the arbitrary opinion or judgment, that he who cannot make such a preparation when all the details are laid down step by step before him, is unfit to be trusted with the dispensing of medicines. It has been made, and skilfully made, by persons of only ordinary pharmaceutical acquirements; and many have refused to make it from the insufficient reason that it involved too much pains and labor. As the essential points or supposed advantages of the preparation,—namely, its uniformity of strength independent of the character or quality of the opium from which it is made, and its freedom from many, if not all of the useless and hurtful constituents of crude opium, whilst retaining the useful constituents in their natural combinations,—as these points are considered essential, are the only objects of the process, and can be attained in no better or more simple way known to the writer, this objection must stand with its full and acknowledged weight against the preparation, with the simple remark that in pharmacy, as in other arts, the best results are not often attainable without commensurate skill and labor.

So much for the revision of the formula, in regard to the objections that have been justly raised against it. The next question that arises is, can it be therapeutically improved? And to this, within the knowledge and judgment of the writer, and of those observant physicians with whom he is in frequent intercourse for counsel and advice, it must be answered that it probably cannot be materially improved in this respect. All opiates, no matter how made or how used, will disagree with many persons, and with some more than others; whilst that opiate which is best borne by some sensitive persons may be badly borne by others. All opiates will constipate almost all persons under all ordinary circumstances, and will produce a nervous reaction proportionate to the initial action, or at least in proportion to the initial overaction or overdosing. Then as all derivatives of opium must in the nature of things partake of the character of opium somewhat

in the relation of cause and effect, it seems most rational to accept together some of those advantages and disadvantages which long observation has shown to be as inseparable as cause and effect, and to seek, rather, by combination with other known agents, or by the subsequent use of corrigents, to remedy the disadvantages in those cases where these are of sufficient importance to demand medication. It is nevertheless now pretty well established, not only that some opiates disagree less than others with sensitive persons, but that some opiates are more generally acceptable and beneficial, and less disturbing than others, and this for reasons of two kinds: First, by excluding some of the disturbing agencies of the opium, and second, by more or less skilful combinations with corrigents. All that can be safely said of the past career of this liquor opii compositus is that it disagrees with a smaller number of sensitive persons, both in its primary and secondary effects, than most other preparations of opium, and that it is more pleasant in its effects than other preparations of opium, or the salts of morphia, in a very considerable proportion of cases, if not generally.

In the deliberate thought and attention given to this preparation during the past few years in connection with its increasing usefulness, it has sometimes seemed doubtful whether the simple depurated watery solution of opium adjusted by assay, and mixed with one-fifth or one-sixth of its weight of alcohol to preserve it from change, would not be the best practical form in which to offer it for therapeutic application. Such a preparation would be called simply liquor opii, and may be made by the formula to be given. This would leave all attempts to modify, correct, or remedy the unpleasant effects of the opiate to the extemporary judgment of the physician, where perhaps they more appropriately belong, because they would be better adapted to individual cases, and would yield a preparation that might be used by hypodermic injection.

This course would be now adopted in the revision of the formula, were it not that the disagreeable taste and smell, and the nauseating effects of opiates, are so objectionable to a large proportion of patients, and that physicians in general are not skilful in the use of corrigents, and therefore not unfrequently fall, or

are led into practices which, to say the least, do not always tend to improve the therapeutic action of their remedies,—the use of sugar-coated pills, for example. It is therefore mainly to cover the taste and odor of the opiate, to render it more acceptable in delicate conditions of the stomach, and to give it a direction or tendency opposite to that of nausea, that a small proportion of acetic ether and purified chloroform are now introduced into it instead of the compound spirit of ether. If these new ingredients have any important medicinal effect, it will surely be in a direction opposite to the natural nauseating and depressing effects of the opiate, and therefore they are safe, with a reasonable chance of being useful.

Such good effects may well be expected from chloroform, and might be secured if the chloroform could be well introduced in larger proportion, for the following principal reasons, which have led the writer to use it in the formula. Soon after the internal use of chloroform was practised it was found to be sedative and hypnotic, or to have very much the same therapeutic effects now attributed to chloral, and was by some physicians associated with opiates, and particularly with the salts of morphia, with very good results in favorably modifying the action, and controlling the after effects, as nausea, anorexia, headache, depression, etc. It was, however, practically very difficult to get the two substances in solution together within the limits of an ordinary dose without inconvenience from the pungency of the chloroform, and the best results were obtained from the clumsy and inconvenient plan of mixing them with thick syrup or honey. The burning effect of the chloroform upon the mouth, fauces and stomach, though of short duration, was objectionable, and thus the association of the two substances, though proved to be eminently advantageous, never came into general use. It was, however, sufficiently used and appreciated to attract the attention of quackery, and the nostrum called “chlorodyne” was the result. It is often wonderful to see how squeamish and critical physicians and patients are to the disadvantages and inconveniences of legitimate extemporaneous mixtures, which, when served to them in the plausible tone of quackery, lose all their disadvantages, and come out afresh with sensational novelty. Chloroform

associated with morphia salts forms the therapeutic basis of the nostrum "chlorodyne," and the extraordinarily incongruous and irrational mixture of molasses, peppermint, capsicum, cannabis, hydrocyanic acid, perchloric acid, and all the others, if there be more, forms a mere vehicle and blind for the attempted secretion of this old and valuable combination. When, however, it came out in this new dress, at the call of the tin trumpet of quackery, many physicians in the very cities where the extemporaneous use of the combination originated became loud in its praise, and their patients found no difficulty in swallowing it at double price. Through the now waning use of this "chlorodyne" and its numerous imitations, many physicians, and some of them without being yet aware of it, have been again taught, on a larger scale, that there is a value in the association of chloroform with their opiates for internal use. But to realize the best effects of this combination the chloroform must be in the proportion of about one fluidrachm to the grain of morphia salt, or about eight or ten minims to the ordinary dose. This makes a mixture which, though not too pungent for many uses, is so rarely needed as to be objectionable for common use.

These considerations led the writer to adopt purified chloroform as an ingredient in the new formula for liquor opii compositus, and a series of experiments was undertaken to determine how much chloroform could be introduced, and still have the solubility or miscibility of the preparation in water secured. This proportion was found to be unexpectedly small, even when the solution was made to consist of one-half its volume of alcohol, thereby taking the character of a tincture rather than a solution. One minim in twenty-five, or one-twenty-fifth of its volume, was found to be the maximum quantity of chloroform which would be permanently held in solution when the twenty-five minims of the preparation was dissolved in one fluidrachm of water or more. This solution when made with a fluidrachm of water was considered a little too near to the boundary line of precipitation of the chloroform, and a little too pungent or biting for common use, and therefore the proportion of chloroform was reduced to one minim in thirty minims of the finished preparation, and the whole formula as finally determined upon was as follows :

Depurated, assayed solution of opium, 14 minims,
(Equal to one-third of a grain of sulphate
of morphia.)

Stronger alcohol, 13 minims.

Purified chloroform, 1 minim.

Acetic ether, s. g. 0·880, 2 minims.

Maximum dose, 30 minims.

In the very full dose of 25 minims there will be,—

Of the opium solution (equal to about one-
quarter of a grain of sulphate of morphia), 11·67 minims,

Stronger alcohol, 10·83 “

Purified chloroform, ·83 “

Acetic ether, 1·67 “

25·00 “

In the average adult dose of 20 minims there will be,—

Of opium solution (equal to about one-fifth of
a grain of sulphate of morphia), 9·33 minims,

Stronger alcohol, 8·67 “

Purified chloroform, ·67 “

Acetic ether, 1·33 “

20·00 “

This preparation, when dropped from a common one-ounce vial, gives about eight hundred and twelve drops to the fluidounce;* or about one and seven-tenths (1·7 drops) drops to the minim. Therefore thirty-four drops is about equal to twenty minims. Thirty drops is perhaps the more common usage as the ordinary adult dose, while twenty-five drops is often sufficient for adult females, or even adult males who are susceptible to opiates.

It is occasionally required in double, or even in three times the maximum dose as above given, and then will of course con-

* The first two fluidrachms dropped from full bottle, 190 drops.

The second two “ 176 “

The third two “ 201 “

The fourth two “ 246 “

tain twice or three times the quantities, equal to two-thirds or one and one-third grains of sulphate of morphia. These doses are, however, under ordinary circumstances poisonous; and it is always best with this, as with all other opiates, to give them in judiciously timed divided doses until the object or indication is *nearly* accomplished, and then stop.

When opiates are given incautiously in large doses, they often seem to meet the indications to their use with a shock or concussion, overwhelming all the powers; and in proportion as this impression is profound and continued, and in proportion as it over-reaches the desired object, in the same proportion is the subsequent reaction, producing depression, anorexia, nausea, headache, constipation, etc. Now in medicine, as in mechanics, it would be irrational to expect to control a reaction independent of control of the initial action, and therefore opiates are not justly chargeable with the results of this not uncommon misuse. On the other hand, however, it is necessary to avoid the very small doses which serve only to stimulate and excite the sensorium; and therefore no direction for dosing can be given that will be more than usefully suggestive to common sense and good judgment, acting upon a clear conception of just what is required to be done, and how easy it is to overdo this.

The plea for assayed preparations in medicine and pharmacy, in order to attain some degree of accuracy and uniformity in therapeutic practice and results, is well illustrated in the instance of opium. It is well understood that hardly any two lumps in a case of ordinary opium yield the same proportion of the useful alkaloids, and that the different lumps have as great a variation as from five per cent. in some, to ten or eleven per cent. in others. It is also well known that by the escape of moisture the proportion of alkaloids is constantly varying until the opium is quite dry. It is also well known that opium is *not* the concrete juice obtained by incision from the unripe heads of *Papaver somniferum*, but is a varying proportion of this juice mixed with a heterogenous mass of foreign matter in a more or less solid condition, and that the productive or unproductive seasons, and the variations and speculations in price, have an influence in the yield of the alkaloids and also in the amount of foreign matters

admixed. If there be any who believe that the opium of the markets is wholly, or even in greater part, constituted of the juice of the capsule obtained by incision as described by the books, it is only necessary for them to divide the whole number of the population of the part of Asia Minor which produces opium, into the number of pounds which constitutes a crop, to prove that it is impossible for any such number of people to collect any such quantities in any such way. It is also known that there are different grades of quality in opium, which *may* be judged by the appearance; and different grades of quality which *cannot* be judged by the appearance, no matter how expert the judge may be. Crude opium, to be officinal, must contain "at least 7 per cent. of morphia." Then this crude opium in drying loses an average of 20 per cent. of moisture. Therefore dried or powdered opium made from crude opium which is just within the officinal minimum limit and no better, will contain 8.75 per cent. of morphia.

The writer has recently seen a small lot of opium that, when dried, yielded a powder containing nearly 15 per cent. of morphia, and knows from actual observation that by appearance, on very critical inspection, it could not be distinguished from another lot which, under the same management, yielded only 12 per cent.; and yet there was only a difference of about \$1.50 or less per pound in the price.

Beside this, opium being a mixture made up for price and profit at the place of production, and being of limited production, but of almost unlimited demand, has of late years assumed the character of a manufacture rather than a natural product; and its practical standing in the markets to-day in regard to dilutions and adulterations at the place of original production is not very different from that of woolen goods in regard to shoddy. Hence the better grades of opium, like the better grades of woolens, are produced in comparatively small quantities for the comparatively small demand at higher prices, and these grades, naturally enough, fall into the hands of the makers of morphia salts, where intrinsic value is closely studied in the interests of pecuniary gain.

Again, so localized and so limited is the production of the

valuable varieties of opium, and so wide-spread and insatiable the demand for opium,—four-fifths of it, at least, being probably consumed as an intoxicant,—that a “ring” of speculators could, and did form a “pool” last year, and so controlled the product and the markets as to run the price up to more than double, and during one period to about three times the ordinary cost, and to maintain such prices for nearly the entire crop, with such signal pecuniary success as to warrant the prediction of future similar speculations. Indeed, at this moment opium is again on the rise, with the possibility, if not the probability, that it is again “cornered” by a “ring.” All this will probably have the very natural effect of stimulating the production; but the production will be stimulated in two ways: not only to cultivate more poppies and make more juice, but also to make more opium from the juice,—that is, debase it still farther in the manufacture, just as wool is made to go farther when the supply is short of the demand, and the price consequently high.

Now if these statements and deductions be true, and have any value in or any bearing upon medicine and pharmacy, they indicate one thing, and teach one lesson which is optional with us to learn or not, and that is, that the comparatively small portion of opium which is used in legitimate medicine and pharmacy should be used only by assay; and that such opium and its preparations should be, by assay, brought to a definite uniform medicinal strength. But from the variation in the various lumps of opium of the same case it is manifestly impossible, or at least impracticable, to assay it with useful accuracy in the crude moist condition. It must be either dried and powdered, and the powder be assayed, or it must be extracted, and the extract be assayed. Opium, then, is an exception to the rule which teaches all careful physicians and pharmacists never to buy drugs in powder. And yet, unless assayed, it is the most unsafe of all drugs to buy in powder. No plan is so good or so safe as to dry and powder the opium, and then assay the powder by extracting that; because, if carefully dried and powdered without too much heat, the quantity and quality of the useful alkaloids are not materially altered, whilst a large proportion of the useless and embarrassing extractive matter is rendered insoluble in the dry-

ing and powdering process. Beside, it is only by drying and powdering that a homogeneous product is obtained, every part of each package of which represents the whole. If a physician or pharmacist buys a pound of powdered opium, the assaying of 150 grains or so of this will indicate the quality of the whole. But if he buys a lump of crude opium and assays any part, or even two or three parts of it, the assay may not, and in all probability will not, represent the whole. He may make the whole lump into a strong tincture or solution by extracting it, and assay a portion of this solution or tincture, with the same ultimate result, but the assay is then less simple and more difficult.

This then is the chief, though not the only merit claimed for this liquor opii compositus, that it is made by assay, and therefore of practically uniform strength, entirely independent of the quality of the opium from which it is made.

This process of assay is not a highly critical scientific process which gives account of every tenth, or even every quarter of a per cent. of the useful alkaloids contained in the opium, but the aim is simply to come within one per cent., or thereabout, of the medicinal value and efficacy of different parcels of opium in its power to produce sedation, and to relieve pain in disease. Whilst a critical morphimetric assay, or an analysis of opium, is one of the most difficult processes within the writer's knowledge, and probably has never been once attained in his thirty years' experience, a practically useful and sufficient process, by various methods, is so simple and easy as to be within the capacity of any person who is at all fit to be trusted with the handling of potent agents in their application to medicine. The first steps of that simple process of assay which is preferred by the writer are those by which the solution of opium which characterizes this liquor opii compositus is depurated, or freed from extraneous matters, whether these be hurtful or simply useless. And this is the second and only other important merit claimed for the preparation. By rejecting much of the resinous, gummy, nauseous, and otherwise hurtful constituents of the heterogeneous mixture called opium, a real practical advantage is obtained; whilst the retaining the useful alkaloids in their *natural combi-*

nations, associated with only that part of the coloring matter and extractive which, like the useful alkaloids, are soluble in both water and alcohol, and insoluble in ether, must be considered as important advantages. Hitherto the preparation has been an aqueous one, or at least contained only one-eighth of its volume of the mixture of alcohol, ether, and heavy oil of wine. But it is now so doubtful whether there is any real advantage in this, that the point is abandoned in order to secure the permanent solution of the chloroform by largely increasing the proportion of alcohol. Hereafter the preparation will contain about half its volume of stronger alcohol,—that is, will be of about the same alcoholic strength as the officinal tincture of opium. This materially disturbs and diminishes the appropriateness of the name, since “liquor” is commonly accepted to mean an aqueous solution, whilst “tincture” is as commonly accepted to mean an alcoholic solution. All good authorities, however, apply the word “tincture” in a technical sense to solutions where the solvent is only half alcohol, or even less. The name, however, cannot now be wisely changed, and the only circumstance which supports its equivocal appropriateness is that the large proportion of alcohol is not present as a solvent of the opium products, nor as a vehicle, since the water performs both these parts, but merely as a preservative agent, and as a solvent and protector for the chloroform and acetic ether; and it therefore may be construed to enter into the nomenclature with its more intimate associates under the word “compositus,” as one of the compounding ingredients.

The preparation may perhaps not unfairly be criticised as unstable, from the great volatility of both the acetic ether and chloroform, since these will have a tendency constantly to escape from it during use. But when it is remembered that these are not essential to its primary medicinal efficacy, and that if entirely evaporated out the medicine would be but one-tenth stronger, the criticism will not have much force. A much more forcible objection to the preparation is often made in regard to its costliness. This objection cannot be satisfactorily met, and need not be attempted, since those who do not recognize the necessity or the value of the time, labor and skill involved in it, and are not

willing to pay a liberal profit upon these as invested in it, of course should not make or use it,—and will not, no matter what might be said in attempted justification of the cost. Upon an average it will represent about one-tenth of its weight of powdered opium; and it will not remunerate the maker unless it yields him about two and a half or three times the cost of that proportion of the best powdered opium.

It happens that the useful constituents of opium are all soluble in both water and alcohol, and are insoluble in ether; whilst a very large portion of the useless and hurtful constituents are insoluble either in water or in alcohol, or when soluble in both are also soluble in ether. Taking advantage of these circumstances the opium is subjected to the action of these solvents in succession, the successive residues being rejected, and the resulting extract is diluted to form the depurated solution. A small portion of this is assayed, and the result of the assay is applied, by multiplication to the whole, and this is then diluted to a definite degree by the addition of the other ingredients and water. Merely to state this general plan or outline of the process without the detail necessary to put it in practice would be of no use, and would really defeat the object of this paper, since that object is not more to convince the reader of the necessity for such a preparation, than to teach him a good practical way of making it for himself, and perhaps, also, to offer what may be a useful lesson in practical pharmacy. Beside, where broad and apparently exaggerated statements are made in any particular interest there is always room for suspicion of advertising; and the cause for suspicion is strengthened when any reserve can be detected, or when any link or point is missing in what should be clear inductive detail. It often happens to the writer, in reading what at first sight appears to be a plain open and sufficient detail of a process, to have his suspicion aroused by a missing link or an ambiguous sentence, and therefore the casual reader must excuse any prolixity in detail that may appear unnecessary in giving the following formula and process, since this prolixity, at least, is not caused by having something to conceal.

In giving the formula and process in the U. S. P. official weights and measures, nearly or practically accurate equivalents

of the metrical or decimal system of weights and measures are also given because they will be found very convenient to some operators, and because it will serve to familiarize those who read them with the values in this system which is coming into use.

Take of powdered opium, 1543 grains or 100 grammes.

Stronger ether,

Purified chloroform,

Acetic ether,

Stronger alcohol,

Water, of each a sufficient quantity.

Put the powdered opium in a suitable vessel of not less than 25 f̄. or 750 cc. (cc. cubic centimetre,—30 cc. to the f̄.) mix it thoroughly with 20 f̄. or 600 cc. of water, and allow the mixture to macerate over night. The water should be added to the powder in small portions with active stirring until a uniform smooth paste is made. The remainder is then added at once and the whole well stirred. A strong stirrer with a spatula-shaped, or spade-shaped end is almost indispensable to the convenient management of this process throughout. It is better to use this large proportion of water at the outset, because it enables the air to separate easily and well from the powder, and thus much improves the effect of the subsequent percolations ;—because it forms a solution so dilute as not to be precipitated by subsequent admixture with the weaker percolates ; and because it very much facilitates the final exhaustion of the residue. The powder continues to absorb the water, and the mixture to diminish in volume for several hours after the mixing.

Take two 9 inch or No. 22 round filters, fold them separately twice in the usual way for plain filters, and open them in the usual way, with one thickness of paper on one side and three thicknesses on the other. Then introduce one folded filter into the other in such a way that the three thickness side of each shall coincide with the one thickness side of the other. This double filter will then have four thicknesses of paper all round, and its effect in percolation is much improved by conducting off the liquid with uniformity in all directions. Place this double filter not too low down in a 5 inch or 12 centimetre funnel, and wet it well by filling the filter and funnel with water for a few

moments. Empty and drain the funnel and filter and place them on a proper funnel stand. Arrange a 16 f̄ or 480 cc. tared capsule or evaporating dish upon a water bath over a gas flame or other sufficient source of heat, and heat the water in the bath to boiling. Place the funnel stand so that the point of the funnel is over the capsule on the bath, and then having stirred up the opium mixture well, fill the filter from it, very nearly up to its edge, and continue to refill it occasionally until the whole of the mixture has been poured in. When the residue in the filter is drained, measure off 6 f̄. or 180 cc. of water, and rinse the vessel which contained the opium mixture two or three times with small portions of this water, dissolving off, or loosening whatever may have become adherent to the vessel by drying, by means of the stirrer, and pour the rinsings one after another into the top of the residue in the filter. Then keep the filter filled up with the remainder of the water until it has all been poured on, and again drain the residue. Then return the residue from the filter to the vessel in which the mixture was made, by the use of the spade-ended stirrer, leaving the filter as clean as possible, and unbroken in its position. To the residue add 1.67 f̄. or 50 cc. of water, stir it well into a smooth magma, and pour it back into the filter, draining and scraping as much of it out the vessel as practicable. Level it down in the filter, or rather so spread it out against the side of the filter as to leave the surface concave. Then measure off 5 f̄. or 150 cc. of water, and rinse the mixing vessel with small portions of this at a time until the vessel is clean, pouring the successive rinsings into the concave surface of the residue in the filter, and keep the filter filled up with the remainder of the water until it is all poured on. When the residue is drained, the filters and residue may be removed from the funnel, be flattened a little upon a folded newspaper, be put to dry, and when as thoroughly dried as the powdered opium was, may be weighed if desirable. In weighing, the outside filter is to be removed and placed in the weight scale to counterbalance the other one, or, if a nice weighing of the residue be desired, the inside filter must be weighed and the weight marked on it with lead pencil before it is used. The dry residue from good powdered opium weighs

about 736 grains or 47·7 grammes. If it be not desired to weigh the residue it is simply thrown away. If the water bath be well arranged, the evaporation of the percolate will be as rapid as its passage through the filter, even if a pretty thick porcelain dish be used. But if a tinned iron or tin capsule be used, the rate of evaporation will exceed that of the filtration, and the capsule will never get more than half full during the process. Stirring is not needed during the evaporation. The filtration and evaporation require from two to three hours. When the residue is drained and disposed of, set the hot capsule and contents on a scale, weigh them and subtract the tare of the capsule. It will commonly happen that the extract weighs less than the original weight of the powdered opium; if so, add water to it until it weighs the 1543 grains or 100 grammes. Then return the capsule to the water bath and warm the contents with stirring until the whole of the extract which has dried upon the capsule is entirely redissolved. Set the capsule on the scale and again add water to make up the loss by evaporation during this dissolving the extract. Return the capsule to the water bath again, and add to the contents 6 f̄3. or 180 cc. of stronger alcohol, stir the mixture till it is uniform, and heat it to boiling. Clean the vessel used for the first mixture of the opium and water, and put into it 12 f̄3. or 360 cc. of stronger alcohol, and while stirring this actively pour slowly into it the contents of the capsule. Rinse the capsule with 1 f̄3. or 30 cc. of stronger alcohol, and add the rinsings to the main portion. Then cover the vessel to prevent unnecessary loss of alcohol by spontaneous evaporation, set it aside for 12 hours, or overnight, and then pour off the clear alcoholic solution from the solid tarry residue. The first portion of alcohol added to the warm watery extract in the capsule is not sufficient to cause a precipitate, but is intended only to so dilute the extract as to render the after precipitation more perfect. The pouring of the contents of the capsule into the alcohol causes an immediate precipitation of a black tarry matter which collects upon the stirrer and vessel; but the solution does not become clear at once. That is, the precipitation is not complete for several hours. The first extraction of the opium by water rejects all the solid mat-

ters, all the resinous matter, much of the narcotin, and in short everything not soluble in water. But the gummy mucilaginous matter and nearly all the coloring matter is soluble in water, and forms a large and embarrassing portion of the watery extract. All the gummy matter and much of the coloring matter are insoluble in strong alcohol, and these constitute the black tarry matter precipitated when the watery extract is diluted and poured into the alcohol. This is the putrescible, fermentable portion of the extract, and its proportion varies greatly with the quality of the opium, being rarely less than 10 or 11 per cent. and rarely greater than 18 per cent. This tarry precipitate contains a small proportion of the useful alkaloids, entangled and carried down with it, and the larger the proportion of this tarry matter the more of the useful alkaloids it will contain. In one instance it was found to contain 0.6 per cent. of the weight of the original opium of morphia. If the precipitation be well managed, however, and particularly if time be valuable, the tarry matter does not contain enough alkaloids to repay the extraction until this residue saved from several operations shall have accumulated. But whether worked singly or accumulated they are dissolved in a little water by warming, the solution diluted with cold water until a filtered portion is no longer made turbid by farther dilution. The solution is then filtered off and the filtrate evaporated on a water bath to the consistence of a very thin extract. About ten times its volume of stronger alcohol is then added gradually, heated to boiling, set aside over night to again precipitate the now clean tarry matter, and then the alcoholic solution is poured off clear, and added to the larger portion of clear alcoholic solution poured off from the first precipitation.

The alcoholic solution is then put into a small tared still and, by means of a water bath, distilled until the alcohol is all over. By a good distillatory apparatus about four-fifths of the alcohol is thus recovered in a more dilute condition than when taken. This, by shaking with about one-eighth of its weight of powdered quick lime and redistilling, is again fit for the same use.

To the extract of opium in the tared still, after distilling off the alcohol, add sufficient water to make up the weight to 1543

grains or 100 grammes, or the original weight of the opium, and warm it in the water bath until the extract is completely dissolved. Then pour this solution into an eight ounce bottle, and rinse the still with a few drops of water, adding the rinsing to the contents of the bottle. When the bottle and contents are cold pour on to the diluted extract 3 f \bar{z} . or 90 cc. of stronger ether, stop the bottle well, shake it vigorously, allow it to stand a few moments till the ether separates, and pour this off as closely as is possible with care. Pour on 3 f \bar{z} . or 90 cc. more ether, again shake vigorously, and pour it off as closely as possible. Repeat this washing with ether a third time, when the accumulated washings will measure about 8 to 8.5 f \bar{z} . or 240 to 255 cc. Put this into the still and distil it to dryness in a water bath with great care, remembering the inflammability of the ether vapor. In this way about 7 f \bar{z} . of 210 cc. of the ether may be recovered in a condition to be used again for the same purpose. The residue from the ether washings varies very much in different parcels of opium, but may average about 1 per cent. of the weight of the opium. It is always a mixture of dark oily matter of a nauseous disagreeable odor, and a mass of solid matter which is amorphous or crystalline according to the rate of evaporation and the amount of heat used. By spontaneous evaporation large square tabular crystals are formed. Pour the diluted extract of opium, with the shallow stratum of ether which could not be poured off, from the bottle into the evaporating dish, and by means of the water bath evaporate it to about one half its volume. Put 10 f \bar{z} . or 300 cc. of water into the cleansed vessel first used for mixing the opium and water, and pour into this the contents of the evaporating dish, rinsing the dish with a little water, and adding the rinsing to the larger portion. This dilution produces another insoluble precipitate, but one which is loose and flocculent and easily washed on a filter. At this point it is necessary to decide whether the solution is to be made up or finished by weight or by measure, though it may be done by both, the weight answering as a check upon the measure, and *vice versa*. As it is always given by measure, (drops or minims) and has its formula constructed upon minims or volume;—and as different parcels of opium yield the

depurated solution of different densities, it would seem only proper to make it up by measure. But the measures usually accessible are so much less accurate than the weights that they cannot be relied on. Beside, the broad surfaces of measures are not calculated to give that degree of practical accuracy required now a days in adjusting potent medicinal agents. Under these circumstances measures and weights applicable to the average grades of opium will both be given, even at the expense of complication. But the operator who may have a set of weights which agree tolerably among themselves is advised to use these in preference to measures.

Take a tared flask marked in the neck to hold 17 f \bar{z} , or 510 cc., (a common French or German half litre flask which is marked low in the neck answers well,) filter the opium solution into it, and wash the filter and residue through with a little water. To this solution add 1574 grains or 102 grammes of stronger alcohol, and, having agitated the mixture, add water until the whole weighs 7870 grains or 510 grammes. This 1574 grains or 102 grammes of alcohol, measured at a temperature of about 17° C. = 62·6° F., measures 4 f \bar{z} and 48 m, or 123 cc., but when this is mixed with the watery solution there is a contraction of volume in the mixture equal to about 162 m, or 10 cc., and an increase of temperature of 3 or 4° C. = 5·4 or 7·2° F. When the mixture is made up to the 7870 grains or 510 grammes it will measure more than the 17 f \bar{z} , or 510 cc., on account of the rise of temperature. When, however, it is cooled to the original temperature at which the liquids were when mixed, the measure will commonly be but a small fraction over or under the measure, as the opium contains more or less extractive soluble in both water and alcohol. This 7870 grains or 510 grammes of solution now contains 20 per cent. of its weight and 30 per cent. of its volume of the stronger alcohol; and is about the density of water,—that is 1 cc. at 17° C. weighs about 1 gramme. It is perfectly clear, and will remain so indefinitely, as it contains alcohol enough to prevent any change even in the warmest weather. It is now ready for assay, and should be kept in a bottle to prevent loss by evaporation while waiting for the result of the assay.

The process of assay consists simply in precipitating the morphia from an aliquot part of this solution by means of ammonia, —drying and weighing the morphia, and applying the result, by multiplication, to the remainder of the solution, so as to ascertain the quantity of morphia which this contains. By this, of course, the farther dilution and adjustment are made. Although this process of assay does not pretend to be critically accurate, yet it will be so in proportion to the care and nicety with which the different steps are followed as now to be described; and whilst without any extraordinary degree of skill it may be so conducted as to indicate within three or four tenths of a per cent. of the morphia value of the opium used, it can hardly be so mismanaged as not to come within one per cent. of the true value.

Take one-seventeenth part, or 463 grains = 30 grammes, or about 1 f $\frac{3}{4}$, = 30 cc. of the solution, and put it into a small tared capsule, and set the capsule in a saucer or plate which contains a shallow stratum of, or is about half filled with, water. Then make a mixture of equal parts of officinal water of ammonia and stronger alcohol, and take of this mixture about 77 grains or 5 grammes, or 5 cc., rather more than less,—and add it to the contents of the capsule. Stir the mixture and then cover the capsule with a large beaker or other glass vessel, inverted so that the edge of the beaker or vessel rests on the saucer or plate in the water, and allow the whole to stand at rest during two days or thereabouts. If there be no alcohol added to the water of ammonia, it will sometimes precipitate a portion of the morphia at once, and with it an undue proportion of coloring matter. When diluted with alcohol and in a somewhat alcoholic solution the morphia goes down gradually and slowly in the form of a crystalline crust of a chestnut-brown color, which adheres to the bottom and sides of the capsule. The precipitation is generally complete in 24 hours, often in 12 hours, but is occasionally retarded by unknown causes. It rarely increases after 48 hours, however, and this period is fixed in order to render the result pretty secure. The quantity of ammonia used may vary considerably without materially affecting the result. The quantity indicated is quite enough for opium of the best quality, but

it may be increased one-fourth, or even one-half without much disadvantage. The morphia thus precipitated is not pure, but contains coloring matter enough to give it a light brown, or a chestnut-brown color. The quantity of coloring matter present is, in weight, surprisingly small, and is fully counterbalanced by the small proportion of morphia which refuses to crystallize out. The results are therefore pretty accurate, or at least practically accurate. If the little capsule with the assay be allowed to stand merely covered with paper or a watch-glass for the 48 hours, some of the solution will evaporate away, and form a hard ring of dried extractive matter upon the capsule all round the edge of the liquid, and this would be subsequently weighed as morphia. A pellicle forms on the surface too, and in whole or in part remains in the capsule when the mother liquor is poured off. By the simple device of covering the capsule, and preventing all change of air by a water joint, as described, all this inconvenience is avoided. And beside, the water absorbs the vapor of ammonia as the excess of this precipitant is given off from the solution, and diminishes this excess about as well as if the capsule was left exposed for it to fly off. At the end of the 48 hours the mother-liquor is poured off clean from the adherent crust of morphia which lines the capsule, and the capsule is supported on edge upon some folds of bibulous paper for half an hour to drain. It is then put in a larger capsule on the water bath for an hour to dry, when it is ready for weighing. This weighing should be done on a scale sensitive to about the eighth or the fourth of a grain, and with good weights of course. The capsule and contents are weighed, and the tare or weight of the capsule is subtracted; and the weight of morphia thus ascertained will be in proportion to the quality of the opium. If the powdered opium be within the officinal limit the morphia will weigh not less than 7.72 grains or 0.5 gramme, but it may weigh anywhere between this and say 15.4 grains or 1 gramme. Now as the whole of the solution represented the whole of the opium, and as one-seventeenth of the solution has yielded a quantity of morphia which is now known, it is only necessary to multiply this quantity by 17 in order to know what the whole solution would have yielded if precipitated in this way; or to

multiply it by 16 to know how much morphia the remaining sixteen-seventeenths of the solution contains. Suppose the morphia in the capsule to weigh 11·42 grains or 0·74 gramme. Then $11·42 \times 17 = 194·14$, and the 1543 grains of powdered opium taken contained 194·14 grains of morphia. Then, as $1543 : 194·14 :: 100 : 12·58 =$ the percentage of morphia in the opium. Or, it weighs 0·74 gramme. Then $0·74 \times 17 = 12·58$, and the 100 grammes taken contained 12·58 grammes of morphia. Then, as $100 : 12·58 :: 100 . 12·58 =$ the percentage of morphia in the powdered opium. But there is only sixteen-seventeenths of the solution remaining, and the other seventeenth part in this supposed case has given 11·42 grains or 0·74 gramme of morphia. Therefore, this quantity multiplied by 16 would give 182·72 grains or 6·04 grammes as the whole quantity of morphia in the remainder of the solution.

This is by no means the only process of assay well adapted to this purpose, and perhaps not the best one. Any of the ordinary morphimetric processes are good enough, and here, as in most chemical processes, that one is best to which the operator is best educated, and with which he has most experience. A practice of nearly twenty years, growing out of the old Staples process for the extraction of morphia, has led the writer to place a good deal of confidence in this plan; and though it does not pretend to critical accuracy, it is doubtful whether any process that is more complex, more difficult, or more critical, would be adapted to the present condition of pharmacy. Pharmacy should not pretend to be chemistry, and results in this direction which may be far short of chemical accuracy would be an important advance for pharmacy. Simple and easy processes of assay are alone applicable to pharmacy, and the practice of such soon leads to greater accuracy in these first, and then to more accurate processes. This process of assay is easily applicable to powdered opium, and gives results the accuracy of which is proportionate to the dexterity with which it is applied. If a parcel of powdered opium is to be assayed by this process, it is only necessary to take 10 grammes = 154·3 grains, instead of 100 grammes = 1543 grains, and then to divide the whole detail as given by 10. Indeed, the whole detail given is but the writer's process of assay

for opium multiplied by 10, and to him it appears both simple and easy, and has often been verified by extractions of morphia on the large scale by various processes.

Now it is probable that the average yield of morphia from good powdered opium now-a-days will not be over 10·5 to 11 per ct. And the officinal tincture, containing 1·25 troyounces or 600 grains of such opium to the pint, would therefore contain 63 to 66 grains of morphia to the pint. Hence 64 grains of morphia to the pint, or 4 grains to the fluidounce, is assumed as the standard of strength of the officinal tinctura opii, or laudanum.*

This assumed strength for the officinal tincture has always been used as the standard of strength for liquor opii compositus, and will continue to be so.

It is therefore only necessary to divide the number of grains of morphia contained in the remaining sixteen-seventeenths of the depurated solution by 4, in order to obtain the number of fluidounces of 30 cc. each, to which the solution must be made up when finished for use. In the supposed case the 182·72, or say 183 grains, divided by 4, gives 45·75 fluidounces, or 1372 c.c., as the measure for the finished solution.

Now if it be desired to make the simple liquor opii, as suggested on page 37, it is only necessary to add water and alcohol in the quantities indicated by the assay, keeping the proportion of alcohol as small as may be with safety. With one-sixth of its weight of alcohol the preparation would probably keep indefinitely, and could then be used by hypodermic injection.

When the solution is to be made into liquor opii compositus, the proceeding is less simple.

Thirty cubic centimetres or a fluidounce of the preparation, when carefully and accurately made on the basis given on page 39, weighs from 28·95 to 29·05 grammes, or from 446·76 to 448·30 grains, varying to this extent only when made from different parcels of good, and only fair quality powdered opium. Twenty-nine grammes, or four hundred and forty-seven and a

* Morphia ($\overline{M}_o = 303$) is to crystallized sulphate of morphia (\overline{M}_o , $SO_3, 6HO, = 379$) as 303 is to 379 or thereabouts, and therefore 4 grains of morphia is about equivalent to 5 grains of crystallized sulphate of morphia.

half grains, is therefore adopted as the standard weight of thirty cubic centimetres, or one fluidounce of a properly made preparation, measured at 17° C. = 62.6° F.

This would indicate the following composition or formula for each 30 c.c. or 1 fluidounce of liquor opii compositus :

Depurated solution of opium containing,—

4 grs. morphia, 14 c.c.=15.047 grms.,=232.17 grs.=51.887 p.c.

Stronger alcohol, 13 c.c.=10.686 “ =164.91 “ =36.848 “

Purif. chloroform, 1 c.c.= 1.499 “ = 23.13 “ = 5.169 “

Acetic ether, 2 c.c.= 1.768 “ = 27.29 “ = 6.096 “

30 c.c.=29.000 “ =447.50 “ =100.000 “

When it shall have been determined by the assay how many fluidounces of the finished preparation the solution will yield, this number of fluidounces is to be multiplied by 447.5, or the number of grains in each fluidounce when finished, and the product will be the weight in grains of the finished preparation. This number of fluidounces multiplied by 164.91, or the number of grains of alcohol in each finished fluidounce, will give the weight in grains of the whole quantity of alcohol required. But a constant quantity of 1574 grains of the alcohol is required in, and has already been added to the watery solution before the assay, and therefore this quantity must be subtracted from the whole quantity required, and the remainder, only, must be taken for the final adjustment. This same number of fluidounces of the finished preparation multiplied by 23.13, or the number of grains of purified chloroform in each finished fluidounce, will give the whole weight in grains of chloroform required. The same number of fluidounces of the finished preparation multiplied by 27.29, or the number of grains of acetic ether in each finished fluidounce, will give the whole weight in grains of acetic ether required. These calculations are really simple, and may be usefully illustrated by continuing the supposed case taken to illustrate the application of the assay.

The 182.72 grains of morphia found to be in the remainder of the solution assayed (the 16 fluidounces or 480 c.c.), divided by 4, gives 45.75 fluidounces or 1372 c.c. as the measure for the finished liquor opii compositus when it shall contain the required

four grains of morphia in each fluidounce. Then 45.75 fluid-ounces multiplied by 447.5 grains, the weight assumed for each fluidounce of the finished preparation, gives 20473.125 grains, which is the weight to which the solution must be made up in finishing it. Then $47.75 \times 164.91 = 7544.63$, which is the whole number of grains of alcohol to be contained in the finished preparation. But the constant quantity 1574 grains of alcohol has already been added before the assay, and therefore this must be subtracted from the whole quantity. Then $7544.63 - 1574 = 5970.63$, which is the number of grains of alcohol still required to finish the preparation in this supposed case.

This latter quantity is weighed into a tared bottle which will hold the entire finished preparation.

Then $45.75 \times 23.13 = 1058.20$, which is the number of grains of purified chloroform required. This is weighed in any convenient vessel, and poured into the bottle containing the alcohol. Then $45.75 \times 27.29 = 1248.52$, which is the number of grains of acetic ether required. This is weighed in the vessel used for the chloroform, and is also poured into the bottle with the alcohol. The bottle is then shaken to mix the contents, the assayed opium solution added, and the bottle again shaken. This remainder of the assayed opium solution weighed 7407 grains, and consisted of 5926.6 grains of watery solution and 1481.4 grains of alcohol. It originally weighed 7870 grains, and consisted of 6296 grains of watery solution and 1574 grains of alcohol, but 463 grains of the mixture (370.4 grains watery and 92.6 grains alcohol) was taken for assay. The bottle now contains of

Assayed opium solution,	7407.00 grains.
Remainder of the alcohol,	5970.63 “
The chloroform,	1058.20 “
The acetic ether,	1248.52 “
	<hr/>
Making,	15,684.35 “

But it is required to weigh $20,473.125$ grains, and this weight is to be made up with water. Therefore, $20,473$ grains less $15,684$ grains gives 4789 grains as the quantity of water required to complete the weight and finish the process.

Leaving the completed illustration now, and resuming the

formula : Take a tared bottle of sufficient capacity to hold the finished preparation, and having weighed into it in succession the remainder of the alcohol required, the purified chloroform and the acetic ether, shake them together and then add the opium solution. Then set the bottle on a scale, and having carefully adjusted the weights to the required complete quantity, add water until this quantity be made up, and shake the mixture. Upon first adding the water the mixture becomes cloudy and suffers contraction and consequent rise of temperature, and if measured now, to control the weighing, the measure will be found plus. But after standing over night, the measure should be found pretty nearly accurate, if the measures used be good. The French litre and half-litre flasks, and a pipette graduated upward in cubic centimetres to 30 or 50 cubic centimetres, are not only extremely useful in this process, but also for many uses, and particularly for testing the accuracy of graduated measures.

When the completed preparation is well shaken, the cloudiness disappears, and it gives a clear bright solution of a deep brownish or yellowish garnet color, and having a rather oily fluidity as it drains down the sides of a glass vessel. The taste is sweet, pleasantly aromatic and somewhat pungent at first, but soon passes to a peculiar, not intense bitterness—the bitterness being that of other opium preparations, but less intense, less disagreeable, and less persistent, and comparatively if not wholly free from the nauseous quality of the opium bitterness. The odor is a refreshing agreeable admixture of the acetous pungency of the acetic ether and the sweet pungency of the chloroform, and recalls that of the vinaigrette smelling-bottle used as a restorative by the ladies. It is miscible in all proportions with alcohol, water, wine, syrup, etc., and is thus well-adapted to compounding in prescriptions. It is perhaps best given in water, the quantity of water being varied at pleasure, but generally limited to the smallest convenient quantity—say, a teaspoonful or a tablespoonful of ice water to each dose. When first mixed with water the mixture is cloudy, but this cloudiness is only momentary.

The dilution, and the irritant action of the chloroform, acetic ether, and the large proportion of alcohol, interfere materially with its application by hypodermic injection. The old liquor

opii compositus was badly adapted to this mode of administration, but was still often so used. This new formula is, however, much less applicable to use in this way. It may, however, be rendered applicable in precisely the same way not unfrequently adopted with the old preparation, namely: by exposing a weighed small quantity at a time, in a shallow vessel in a warm place, until the weight is reduced to one-half or one-third. If reduced to one-third, it will be about the strength of the solution of sulphate of morphia called Magendie's solution; but it will then have too little alcohol to keep longer than a few weeks. If reduced to one-half, the chloroform and acetic ether and much of the alcohol will pass off sufficiently, and yet leave enough alcohol to preserve it. If the alcohol be all or nearly all driven off, the effect of very dilute solutions of phenol, or the so-called carbolic acid, in protecting solutions for hypodermic use from change, may be resorted to. All solutions for such use should be perfectly clear and bright, either by settling or by filtration, and should be carefully guarded against decomposition, since many of the accidents which occur in hypodermic medication are probably caused by the introduction of liquids which are undergoing change, or by inoculation from a badly kept or imperfectly cleaned syringe point.

The compound solution of opium evaporated on a water bath to one-fourth its weight or less, then diluted to one-third its original weight with water, and, when cold, filtered, will give the best solution for hypodermic use. But the coloring and extractive matter is objectionable for this use. If such a solution is to be kept even for a few days (and no hypodermic solution should ever be kept long), it may be protected by the addition of about one-fiftieth of its weight of an alcoholic solution of phenol (crystallized carbolic acid) containing two per cent.

In conclusion, it may be remarked in connection with this liquor opii compositus, as in regard to other agents which are liable to become hobbies, that perhaps the greatest skill in using it is to know when to prefer something else.

Brooklyn, Dec. 15, 1869.

ON TINCTURA OPII CAMPHORATA.

BY J. B. MOORE.

R. Powdered Opium, No. 50.

Benzoic Acid, . . . *aa.* sixty grains.

Camphor, forty “

Oil of Anise, a fluidrachm.

Clarified Honey, two troy ounces.

Alcohol.

Hot Water, temp. 200°, *aa.* one pint.

Diluted Alcohol, q. s.

Pour the hot water upon the powdered opium in a covered vessel, stir well, and when sufficiently cool, transfer to a stoppered bottle, and macerate with occasional agitation for three hours; then strain the infusion through muslin, with expression, macerate the residuum with the alcohol in a stoppered bottle, in like manner, for three hours longer, then strain and express as before. Mix the infusion and filter, and upon the drugs packed in a small glass percolator, pour gradually the filtered mixture, and when it has all passed, continue the percolation with diluted alcohol until two pints of tincture are obtained.

Then dissolve the camphor in the oil of anise in a mortar, and to the solution add the benzoic acid and rub well; to this add gradually the honey and rub until a smooth mixture is formed. Lastly, add this to the two pints of tincture first obtained, shake well and filter.

This is an expeditious mode of making paregoric, and affords a faultless preparation. When carefully manipulated, the opium is so thoroughly exhausted as to be deprived of taste.

The mixed infusions are directed to be filtered before percolation, in order to remove the resin and caoutchouc taken up by the alcohol and which separate when the infusions are mixed, which, if not previously removed, somewhat embarrasses percolation.

The filtration and percolation can both be conducted at the same time, and the filtrate supplied to the percolator as it passes.

When the tincture is prepared in the quantity of a gallon or

more at a time, the increased bulk of opium can be more conveniently adjusted in the percolator than when such small quantities are worked.

The writer would state in this connection that, in his article on tincture opium, which appeared in the last number of this Journal, he omitted, in the first line of the directions to that process, the following words: "*in the hot water,*" which should have followed "*powdered opium.*"

Philadelphia, October, 1869.

NOTE ON CAMPBELL'S PROCESS FOR FLUID EXTRACTS.

BY GEORGE W. KENNEDY.

TO THE EDITOR:

Dear sir, allow me to make a few remarks on Campbell's process for fluid extracts. Being in a large house in this city in charge of the prescription department, and using hundreds of pounds of fluid extracts, at wholesale and retail, annually, until lately, all our stock of them was received from Northern houses. Not being satisfied with their quality, I suggested to the firm to make the fluid extracts, in connection with the other business, which was agreed to. Among the objectionable fluid extracts was one of buchu, which could hardly be recognized by its odor, and when examined was found to yield but one-fourth of one per cent. of volatile oil, whilst the drug contains from three-fourths of one per cent to one and a half per cent., according to the variety.

I think the time has come when every druggist should prepare the fluid and solid extracts he sells, to protect himself from worthless or inferior preparations, which are to be found in commerce. The excuse is that too much time and trouble are required, but they would gain reputation and business two-fold by doing so.

I first made 20 lbs. of fluid extract of buchu according to Mr. Campbell's process, and found it to be a very fine extract. The dregs left when percolated with alcohol of .835 sp. gr. did not show the presence of volatile oil or resin when water was added, and had no odor of buchu whatever.

The next operation was 40 lbs. of fluid extract of wild cherry (*cerasus serotina*). This, I think, is the most troublesome of all the fluid extracts, and the result here was the same as with the buchu. I think the glycerin process should be used in making all the fluid extracts, and particularly in this one, for which it seems well adapted.

The next substance treated was vanilla. I took an ounce of vanilla, cut it transversely into small pieces, rubbed it into powder with sugar, moistened it with a mixture of one part of glycerin and three of alcohol, and packed it into a conical glass percolator; let it stand four days, and then percolated with a mixture of two parts of alcohol and one of glycerin, and one of water until a pint of liquid passed; forming a very fine extract.

I think the proportion of menstruum used to moisten in the resinous drugs, such as ginger, lupulin and podophyllum, is too great; twelve fluid ounces being preferable, adding the balance after the four days maceration, and continue the percolation until the displacement is effected. I never insert the cork; using a piece of fine sponge in the neck of the percolator.

Memphis, Tenn., Nov. 5, 1869.

ON COLD CREAM.

BY J. B. MOORE.

Ceratum Galeni, unguentum refrigerans, or cold cream, as it is more popularly known, is of more ancient origin than many would suppose, having been invented by that learned and distinguished physician Claude Galen, who was born at Pergamus, in Asia Minor, A. D., 131. The formula of this popular ointment has undergone many transformations since its birth, more perhaps than that of any other preparation in our official list. In fact almost every one has his own peculiar way of making cold cream, and there are but few pharmacists who prepare this time-honored ointment by the same recipe. Besides the numerous formulas that have been published in the various pharmaceutical journals, I find collected together, in the Pharmacopœia Universalis, edition 1833, from the various Pharmacopœias of the

world and other sources, not less than twenty-six. Nearly all of the old formulas contain lard as the base, a few have the addition of wax and suet. The first mention that I have found of the employment of the oil of sweet almonds and spermaceti, is in Coxe's American Dispensatory, edition 1831. In a note the author says: "Under the name of unguentum aqua rosæ, the U. S. Pharm., and of Phil., direct two ounces of oil of almonds, half an ounce of spermaceti and one drachm of white wax, to be melted in a water bath; and two ounces of rose water, to be stirred till the mixture is cold. The New York Pharm. has, we think, done well to discard such trumpery, at least under any supposition of the *two ounces of rose water being medicinal*." So I presume that the present almost universal mode of making this ointment of oil of sweet almonds, spermaceti, etc., is the offspring of our own Pharmacopœia.

The names by which this preparation has been designated are almost as various and numerous as the formulas offered for its manufacture.

As a matter of curiosity, and to show to those who are not already aware of it how this ointment was prepared in the days of *yore*, I will append a formula which I copy from an old and valued relic in the possession of the writer, a copy of an old London Dispensatory, edited by Nicholas Culpeper, published in the year 1650, and now nearly 220 years old. Judging from a survey of the contents of this book, I am forced to the conclusion that pharmacy at that period was *really* in its infancy. Many queer old formulas, with directions and observations by the author, couched in quaint and, now-a-days, ludicrous language and expressions, are to be found therein.

I copy the formula, with the comments of the author, *verbatim et literatim* :

"Unguentum refrigerans, Galenus.

It is also called a cerecloth.

Take of white wax four ounces, oyl of roses omphacine a pound; melt in a double vessel, then powr it out into another, by degrees putting in cold water, and often pourcing it out of one vessel into another, stirring it till it be white; last of all wash it in rose water, adding a little rose water and rose vineger.

A. It is a fine cooling thing, (for what denomination to give it I scarce know) and exceeding good, yea super-excellent to cure inflamations in wounds or tumors."

The above, I presume, is the original formula of Galen.

I will now present a formula for cold cream which I have employed for several years with unusual satisfaction. It affords an elegant ointment and of good consistency, of sufficient firmness in summer and not too hard in winter. It also possesses the desirable quality of keeping well at all seasons. I consider it greatly preferable to that prepared with rose water for popular use; and is also eligible as a substitute for the officinal ungt. aquæ rosæ for almost any purpose. Should the proportions given yield a preparation of too firm consistence in cold weather in some sections of the country, the quantity of wax may be lessened. The quantity and kind of perfume may also be varied to suit the fancy.

R	Ol. Amygdal, Dulc.	f℥ xss.	
	Cetacei	℥iij 3vj.	(Troy)
	Ceræ Albæ	℥. x.	
	Ol. Rosæ	gtt. vj vel gtt. x.	

Melt together, by means of a water-bath, the oil, spermaceti and wax, and strain through muslin if necessary; stir constantly until it begins to thicken; then beat it well, and when it has become quite cool add the oil of rose and continue the beating process till the oil is thoroughly incorporated and the ointment is of a snowy whiteness. Any stray portions that might unavoidably harden upon the sides of the dish should be removed, and rubbed perfectly smooth upon an ointment slab, before admixture with the rest.

The true secret in making an ointment of this kind nicely, consists in stirring and beating it well while cooling. A little extra labor bestowed upon this part of the operation will be well spent, and amply repaid by the enhanced beauty and elegance of the product.

A capacious porcelain evaporating dish should be employed, in which to prepare this ointment.

Special care should be taken in the selection of the ingredients, and none but fresh, sweet and strictly pure should be

used, and the use of the water-bath should never be omitted, as it precludes the liability of injury by heat.

Some pharmacists add glycerin to their cold cream, but I cannot perceive any advantage whatever in its use, and as it has no affinity with the other ingredients, it does not make as smooth nor as handsome an ointment as can be made without it. And medicinally, I think, it adds nothing to the value of the preparation beyond the imagination.

Philadelphia, Dec., 1869.

ADIRONDACK MINERAL SPRINGS.

By JOHN BELL, M. D.

Among the mineral springs of recent discovery which seem to be entitled to claim attention for their medicinal properties, we find the Adirondack. This spring derives its name from its flowing from the base of one of the spurs of the Adirondack mountains, in the town of Whitehall, and at the head of Lake Champlain, in the State of New York. The water may be regarded as a saline chalybeate, and by French writers acidulous chalybeate, with a considerable quantity of free carbonic acid. After being at rest for a time it allows of a precipitate of a reddish color, which disappears by shaking. It is without smell and any very marked taste.

An analysis of Water of the Adirondack Mineral Spring, by Professor Collier, of Vermont University, Burlington, gives the following results :

One Imperial Gallon of 70,000 grains.

Sulphate of Lime,	11.134 grains.
Carbonate of Lime,	18.543 "
Carbonate of Magnesia,	16.618 "
Carbonate of Iron,	5.040 "
Carbonate of Manganese,	traces
Carbonate of Potash,	5.317 "
Carbonate of Soda,	5.135 "
Carbonate of Lithia, . . . . .	.023 "
Chloride of Sodium,	14.340 "
Alumina,	traces
Insoluble Residue,	7.42 "
	<hr/>
	76.892

Free Carbonic Acid, 67.3 cubic inches.

We see from the above analysis that the Adirondack is distinguished from the general run of mineral waters by its containing a larger proportion of iron and the alkalies, potassa and lithia, all in the form of carbonates. In looking over the analyses of the different mineral springs of Europe, we find but two, Bourbon L'Archambault and Cransac, both in France, which can compete as chalybeates with the Adirondack potassa and lithia, which exist in appreciable quantity in the latter spring, are, in nearly all others, entirely absent, or exhibit *traces* only of their presence. We must except from this remark, as relates to lithia, its large proportion in some of the springs at Saratoga, and in two new artesian wells at Ballston.*

Every newly discovered mineral spring must be regarded as an acceptable addition to our *Materia Medica*, and the Adirondack is presented to us as a medicinal agent, possessing marked curative powers in different diseases. Those in which it has been found most efficacious are *sub-acute and chronic rheumatism* and *affections of the kidneys and bladder*; after these come *dyspepsia* and certain *cutaneous eruptions*. Cases coming within my own observation and those kindly communicated to me by professional brethren of this city, confirm the statements of the medical gentlemen at Whitehall, and of other intelligent persons, going to show the very decided operation of this water as a diuretic, and under circumstances too in which the most approved medicines of this class had failed to produce the desired effect. In nephritic calculi or gravel, complete relief has been obtained, and in two cases the water, to use the expressive language of one of my informants, "washed out" calculi, and at the same time freed the patient from discharges of bloody urine and mucus, and one of them from albuminuria. A case of obstinate rheumatism, in which the knee joint had been long affected, and the usual remedies tried without avail, yielded to the free and somewhat prolonged use of the water. That most troublesome, and so often unmanageable disease, *diabetes mellitus*, has been not only arrested in its course, but cured, by drinking of the Adirondack water—on the testimony of Drs. Long, Gordon and Bennett, of Whitehall. Dr. Shumway, of

* Chemical News, September, 1869.

the same place, after having used it on himself, and watched the experience of its curative powers on others, dwells on its great value in diseases of the urinary organs, and adds, "all chronic cutaneous eruptions, blotches on the face, including that intractable eruption *acne punctata*, have been entirely removed." With a knowledge of its actively diuretic operations it is easy to infer the adaptation of this water to dropsy, and to various forms of chronic derangement, including atonic dyspepsia and imperfect secretion from the liver. Its largely alkaline and chalybeate character would induce trials of it in heart-burn and water-brash, and in diarrhœa assuming a chronic form. Its efficacy has indeed been tested with success in the last of these diseases. In full doses the water acts, although not with any uniformity, as an aperient; but its apparently slight action in this way is accompanied by effects on the biliary secretion of a more decided character than would be produced by strong purgatives.

The quantity of the water to be taken is a half pint tumblerful three times a day, in diseases of the kidneys and bladder, and when a laxative effect is desired. In skin affections, half a glass three times a day will suffice, and, at the same time, the water, made tepid, is to be applied externally.

NOTE ON A SAMPLE OF SO-CALLED OPIUM FROM ILLINOIS.

By WILLIAM PROCTER, JR.

This "opium" was deposited by Dr. D. G. Plummer, in the exhibition of drugs, etc., at Chicago, in Sept. 1869. It was in the form of a block, two inches square and four or five inches long, of a dark greenish-brown color, narcotic odor, and soft uniform consistence, having much the appearance of a good narcotic extract. A section of this, weighing about an ounce, was presented to the writer, with the request that it should be examined. On inquiry as to the manner of obtaining this substance, it was understood to be made by the process of Wilson, of Vermont opium notoriety, by expressing the juice from the whole plant, leaves, stalks, and capsules, and evaporating the juice to the proper consistence without any extraction of the

special juice of the capsules by incision. It was hence inferred to be very meagre in alkaloids.

Before the assay the sample had lost much moisture, was tough, nearly dry, and with a dark-brown resinoid fracture. Of this, 100 grains was rubbed down with a little water in a mortar to a smooth paste, more added and percolated in a funnel till the dregs were exhausted. The liquid was treated with lime, muriatic acid and ammonia, by Mohr's process, (noted in last volume,) and set aside for 24 hours. The precipitate collected in a filter, washed and dried, weighed 0.5 grain, much colored. This was treated with boiling alcohol, and the alcoholic solution evaporated, a minute yellowish white crystalline residue was obtained, which reacted like morphia with nitric acid and sesquichloride of iron. As this product did not represent more than one-fifth of one per cent., assuming it all to have been morphia, it is sufficient evidence of the worthlessness of this so-called "opium," which is in reality merely extract of poppies.

PHILA., Dec., 1869.

ON GLYCERIN LOTION.

By J. B. MOORE.

Upon the advent of cold weather nearly every one feels the need of some preparation to apply to the face and hands, to prevent and cure chaps, roughness and irritation of the skin, caused by exposure to the cold during the winter and spring seasons of the year. Almost every apothecary has more or less demand for a remedy of this kind, and many include some application of this character among their *specialties*. Having what I consider a most excellent recipe for such a preparation, I here offer it for the benefit of those who wish to make such a preparation, and have not already a better formula:

R. Glycerin,	f℥iij
Mucilage Quince Seeds, U. S. D.,	f℥x
Pulv. Cochineal,	grs. v
Hot Water,	f℥iss
Deod. Alcohol,	f℥iiss
Oil Rose,	gtt. viij
Pulv. Gum Arabic,	3ss
Water,	f℥viij

Rub the powdered cochineal first with the hot water gradually added, and then add the alcohol. Then triturate the oil of rose well with the powdered gum arabic, and gradually add the water as in making emulsion. With this mix well the solution first formed and filter, and to the filtered liquid add the glycerin and mucilage of quince seeds, and shake well.

The mucilage of quince seeds should always be freshly made. If the alcohol is sweet and free from foreign odor, and the glycerin perfectly inodorous, a less quantity of oil of rose may suffice.

If care is taken in its manufacture, this will form a beautiful and elegant preparation, with a rich rosy fragrance.

When applied to the skin it imparts an agreeably soft, smooth and *velvety* feel. It is an excellent application for the face after shaving.

I have tried many similar combinations, but have never sold an article that has been so generally admired and so universally popular as this.

Philadelphia, Dec., 1869.

ON *LYCOPODIUM CLAVATUM*, LIN., AND OTHER NORTH AMERICAN SPECIES AS A SOURCE FOR *LYCOPODIUM*.

BY JOHN M. MAISCH.

The club moss, *Lycopodium clavatum*, Lin., and two or three allied species of the same genus, grow in the temperate zone of the northern hemisphere, particularly in the northern half thereof. The *Lycopodium* of commerce is mostly collected in the mountains of Switzerland and Germany; that collected in Poland and Russia is usually less handsome in appearance, and is regarded as of inferior quality.

The sporangia in the genus *Lycopodium* are situated in the axils of the leaves. Two species indigenous to North America, *Lyc. lucidulum*, Mich., and *Lyc. selago*, Lin., have the sporangia scattered along the stem, and consequently ripen but few at a time, so that these species are unfit for the collection of the sporules. The other North American species, seven in number, have the sporangia collected in spikes. Two of these are rather

too small for the collection of the sporules, namely: *Lyc. inundatum*, Lin., which is common in the Northern States and Canada, and *Lyc. alopecuroides*, Lin., which is most abundant in the Southern States,

Of the remaining five species *Lyc. dendroideum*, Mich., and *Lyc. complanatum*, Lin., are perhaps diffused over the greater area, while *Lyc. Carolinianum*, Lin., is confined chiefly to the Southern States, and *Lyc. clavatum* and *annotinum*, Lin., are most abundant northward.

In Europe lycopodium is collected indiscriminately from those species which yield the largest amount of sporules, and these of a size not exceeding those of the true club moss; *Lyc. clavatum*, *complanatum* and *annotinum* are almost exclusively used. The spikes are collected during the months of August and September, dried in suitable vessels in such a manner that no loss of sporules can occur from wind or draft, and the spores are then obtained by beating and rubbing, whereby the sporangia are ruptured; the resulting powder is then passed through a fine sieve to separate fragments of leaves, spore capsules and other accidental impurities.

To the three species mentioned, *Lyc. dendroideum* might be added in this country as a source for commercial Lycopodium, and this might be most advantageously collected in the Eastern States and in Canada. Since, however, the yield is small from the bulky spikes, it is the writer's opinion that the collection of Lycopodium in North America will scarcely pay, owing to the greater value of labor, as long as the European article of unexceptional quality can be bought in this country at from 50 to 70 cents currency per pound.—*Proc. Amer. Pharm. Assoc.*, 1869.

COMPOUND ELIXIR TARAXACUM—THE BEST VEHICLE FOR QUININE.

By P. C. CANDIDUS.

I present to the A. P. Association a formula for the above elixir, which I prepared about eight months ago, at the request of Dr. Jerome Cochran, Professor of Chemistry at the Mobile Medical College. He wanted the virtues of *Prunus Virg.*, *Taraxacum*, and *Gentian*—the latter in small proportion:

R. Rad. Taraxaci, ℥vj. , or Ext. Tarax. fluid. f. ℥vi.

Cort. Pruni Virg., ℥iv.

Rad. Gentianæ, ℥i.

Cort. Aurantii, ℥ii.

“ Cinnamomi,

Sem. Coriandri, āā, ℥i.

“ Anisi,

“ Carvi,

“ Card., āā, ℥ii.

Rad. Glycyrrh., ℥i.

Syrup. Simpl., Oiiiss.

Alcohol and water, in the proportion of 1 of the former to 3 of the latter, a sufficient quantity.

The dry ingredients must be reduced to a suitable degree of fineness for percolation. Mix the alcohol and water, moisten the powder with 6 oz. of the mixture, then pack in a conical percolator, and pour on of the alcoholic mixture until $6\frac{1}{2}$ pints are obtained, then add the syrup and mix them.

Dr. Cochran prescribed it a great deal, mostly as an adjuvant and vehicle of other medicines. One day a gentleman came in to take a dose of quinine. I looked about for something for him to take it in, when my eye fell on the above elixir. I mixed it for him, and to his surprise it was tasteless. As he felt doubtful of its being quinine, I mixed up some for myself, and it proved to be completely masked. I sent some to several physicians, who pronounced it a success. Dr. E. P. Gaines, and other leading physicians, have been prescribing it ever since to their own and their patients' satisfaction. The quinine should be mixed with the elixir at the time it is taken, although when mixed for several days it is still tasteless.

The dose of the elixir is from half to one ounce, and it is no doubt better than the popular stomach bitters flooding the country.
—*Proc. Amer. Pharm. Assoc.*, 1869.

ON A PROTECTIVE AGENT AGAINST MOTHS AND OTHER INSECTS.

BY GEORGE F. H. MARKOE.

QUERY 16th.—What is the best substitute for camphor for the protec-

tion of woollens from moths and other insects, that will be cheaper and more effective

In reply to this query the writer would suggest the use of naphthaline as a substitute for camphor. It is an effective protective agent against the ravages of moths and other insects among woollens and in natural history collections.

When purified, naphthaline is obtained in beautiful crystalline masses, possessing a strong peculiar odor, recalling the smell of coal-tar creosote. In its crude state the crystals are of a brown color, and the odor much more intense than when purified.

Naphthaline has been put to a thorough test by Prof. Asa Gray in Harvard College Herbarium, and in the cabinets of the Boston Society of Natural History. The results obtained in these trials were highly satisfactory and conclusively proving the value of naphthaline as a protective agent against the ravages of the destructive insects that infest woollens and the cabinets of museums.

It is very cheap, being a waste product in the distillation of coal-tar for which no practical use has been found except for fuel and for the manufacture of lampblack.* The only objection the writer can find to its use is its strong odor, which to many people is very disagreeable; this fact will alone prevent naphthaline from becoming a popular substitute for camphor, at least so far as its application to the protection of clothing is concerned; but for use in natural history collections it leaves little to be desired.—*Proc. Amer. Pharm. Association*, 1869.

ON CHLORAL.

By PROFESSOR CHARLES A. JOY.

This interesting compound was discovered in 1832, by Liebig, and was obtained by the action of chlorine upon absolute alcohol. The name is significant of its origin, and suggests at once the method of its manufacture. Chlorine alcohol is abbreviated to chloral, just as aldehyd is al(cohol of) hyd(ro)gen). The Germans have a name for chloral so long that it ought to be mentioned as a curiosity. They call it trichlormethylhydrocarbonoxyd, and sometimes trichloracetoxylwasserstoff, and, again, trichloraldehyd, or trichloracetyloxydhydrat. It is not proba-

* Naphthaline is now used in making dye colors and in the artificial production of benzoic acid.—EDITOR AM. JOURN. PHARM.

ble that the medical profession will adopt any of the long names in making up their prescriptions, but that chloral will reign in all its simplicity. It is worthy of note that nearly simultaneously with Liebig's discovery of chloral in Germany, was Guthrie's preparation of chloroform in the United States, and it is somewhat remarkable that, while the former is just coming into notice as an hypnotic agent, the latter has been employed since 1847 as an anæsthetic, and the present investigations upon it would not have been undertaken if it were not for its relations to chloroform. Although Liebig first prepared chloral, yet we are chiefly indebted to Dumas for a knowledge of its properties and constitution, just as we were for the best investigations upon chloroform. In order to understand how chloral can be made from alcohol, it would be well to write down the formulas of alcohol, aldehyd, &c., and then trace the decomposition that takes place :

	Old.	New.
Alcohol,	$C^4H^6O^2$	C^2H^6O
Aldehyd,	$C^4H^4O^2$	C^2H^4O
Chloral,	$C^4Cl^3HO^2$	C^2HCl^3O
Chloroform,	C^2HCl^3	$C HCl^2$

When chlorine is passed through absolute alcohol, we can see, from the above table, how it takes the place of hydrogen, and forms hydrochloric acid. The reaction may be represented by the following formula, $C^2H^6O + 8 Cl = C^2HCl^3O + 5 HCl$. The actual manufacture of chloral is attended with considerable difficulty and expense.

It is necessary to pass well dried chlorine gas through pure anhydrous alcohol for many hours, as long as it is absorbed, and to keep the vessel cool in the early stages of the operation ; later, the temperature must be gradually raised until the liquid boils. If dilute alcohol be employed, instead of the anhydrous, no chloral is formed, but, in its stead, aldehyd, acetic acid and hydrochloric acid ; hence the necessity of using absolute alcohol. It is also difficult to prevent the formation of other compounds, especially chloride of carbon, which serve to contaminate the chloral and render its administration dangerous. After the chlorine has been passed through sufficiently long, the crude product is mixed with three times its bulk of oil of vitriol and

distilled at a gentle heat. It is sometimes necessary to repeat this operation several times, and finally to distil over quick lime. This is a long and tedious process, and it is not at all probable that it will be followed on a large scale should there be a demand for chloral in medicine. The action of chlorine upon bodies that yield alcohol by fermentation, such as starch, sugar, &c., will be tried, and even wood, after it has been treated with sulphuric acid, might afford it when acted upon by chlorine. Professor Staedeler, formerly of Gottingen, now of Zurich, thought of the possibility of such a reaction, and actually succeeded in making chloral by distilling a mixture of one part of starch (or sugar) with seven parts of hydrochloric acid and three parts of peroxide of manganese; formic acid, carbonic acid and other bodies accompanying it. Some of these latter methods may eventually prove successful, and thus enable us to obtain chloral at a cheap rate. At a recent meeting of the Chemical Society of Berlin, a pound of chloral hydrate was exhibited by two chemists, Martius and Mendelssohn, who stated that, with the co-operation of Dr. Liebreich, they had discovered a cheap and easy method for its preparation, but they refrained from giving the method because they were not through with the research. We also understand that the hydrate is offered for sale in Berlin for about a dollar, gold, per ounce. As a dose only consists of a few grains, an ounce can be made to go a long way, and the price may be considered very moderate. We can hardly expect to procure it in this country for any such price until the demand for it has occasioned the discovery of cheap methods for its manufacture. We are sorry not to be able to give more definite hints in reference to a new way of preparing it, but we feel confident that our skillful pharmacutists will soon be able to get on the right tract.

We now propose to give an account of the properties of chloral. It is a limpid, oily, colorless liquid with a fatty taste, and a strong caustic smell, producing lachrymation. Its specific gravity is 1.502, and it boils at 95°C ., and can be distilled unchanged. It mixes in all proportions with water, also with ether and alcohol. It dissolves sulphur, phosphorus, bromine and iodine, and combines directly with water to form a hydrate. A little

chloral put into a moist flask deposits star-shaped crystals of the hydrate on the sides. The aqueous solution of chloral is indifferent to vegetable colors ; oxides of silver or mercury have no effect upon it ; concentrated sulphuric acid deprives it of water and separates the anhydrous crystals.

One of its most remarkable properties is the change it undergoes spontaneously when kept ; it is altered into a porcelain-like mass called metachloral, which is insoluble, though isomeric with the liquid form. It can be reconverted into chloral by distillation. The white metachloral is insoluble in alcohol and ether, as well as in water, but by contact with water it is gradually converted into the crystallized hydrate of chloral.

Fuming nitric acid changes chloral into tri-chloroacetic acid. An alcoholic solution of potash converts chloral immediately into formiate of potash and chloroform. This reaction may be represented as follows, $C^2Cl^3HO + KHO = KCHO^2 + CHCl^3$. For pharmaceutical purposes chloral hydrate must form a hard, white, crystalline mass, be completely soluble in water, not smell of chloride of carbon or hydrochloric acid, but retain the peculiar, penetrating odor characteristic of chloral. It would be dangerous to employ hydrate of chloral, contaminated by chlorous acetylene, chloride of carbon and other incidental products, and hence great care must be observed in its preparation.

Much attention has recently been called to the hydrate of chloral in consequence of the physiological researches of Dr. Liebreich. This gentleman, in presenting his paper to the Chemical Society of Berlin, May 24, 1869, gave the following interesting explanation of the occasion of his research :

“There are some substances which pass through the body without decomposition and without exercising any appreciable influence on the even tenor of our life ; there are others which go to build up and nourish ; others take up something from the body by chemical decomposition and then leave it ; some are useful, such as acetic acid and sugar. I experimented recently to ascertain if, by the splitting up of certain compounds in the body, the separated compound would exert the same influence it would if administered alone.

“Trichloroacetic acid of Dumas and chloral of Liebig appeared

to be the most favorable for experiment. It is known that these bodies when brought in contact with alkaline solutions split up into chloroform and formiates and carbonates of the alkalies. Both of these substances being soluble in water are easily absorbed; after they have passed into the circulation they come in contact with the alkali of the blood. My experiments proved that the formic acid and carbonic acid had no particular effect, while the chloroform exerted its full influence."

Dr. Liebreich reasoned that what took place outside of the body in the chemist's laboratory ought to follow in the alembic of the stomach; but he preferred to bring his agents directly in contact with the blood by subcutaneous injections rather than wait for the action by the way of the stomach; although in some experiments he injected the compound into the stomach.

Some animals slept in ten minutes after the application, and continued in this state for eighteen hours with quiet pulse and respiration. One man slept for sixteen hours without bad effects. The length of the action is explained on the theory of the gradual elimination of chloroform in the body, and its continuous effect upon the patient until the whole of it was decomposed.

Dr. Jacobi, a distinguished physician of New York, has repeated many of Dr. Liebreich's experiments with great success, and he recently read a very interesting paper on the subject before the New York County Medical Society, giving a detailed account of what he had done. On the other side of the question we find in the *Medical Gazette*, of New York, so ably edited by Dr. A. L. Carroll, a translation of some experiments conducted by M. Demarquay and communicated to the Academy of France, from which the experimenter draws the following conclusions:

"1. Chloral has a well marked soporific effect upon debilitated and weak subjects.

"2. The duration of its action is in direct proportion to the weakness of the patient.

"3. The sleep provoked by it is generally calm, and is only disturbed in patients laboring under acute pains. This leads me to advise it in diseases where it is desired to procure sleep and muscular resolution.

"4. Finally, this agent may be given in quite large doses, as

it has not caused any accidents in the dose of from one to five grammes."

Dr. Demarquay thinks that the chloral is eliminated through the lungs, and states that the breath of the patient smells of it; he does not agree with the theory of Liebreich that it is split up into chloroform and formic acid in the blood, but admits that it is the most rapid of all soporifics.

Dr. Jules Worms arrives at the following conclusions after conducting a series of experiments with the hydrate of chloral.

1. Chloral dissolved in ten parts of water can be drank without any inconvenience to the amount of ten grammes.

2. The effect is felt with $1\frac{1}{2}$ to 2 grammes, but there are some obstinate cases which require a dose of 2 or 3 grammes.

3. A calm sleep, often profound, during which there is no modification in the temperature, in the regularity of the pulse or of the respiration, ensues in ten or fifteen minutes after the digestion of the chloral and continues for seven or eight hours. The waking is not accompanied by headache or nausea of any kind; there may be some dullness, but it is soon dissipated. It can be administered before or after meals, and exerts no influence upon digestion.

To sum up the experience of Dr. Worms, the hydrate of chloral appears to be an inoffensive agent in small doses, and may render important services as a hypnotic. In fact, the property which it possesses of determining sleep almost instantly is not possessed by any other agent that can be introduced internally. It possesses great advantage over opium and its derivatives in the rapidity of its action and the subsequent freedom from torpor and disagreeable sensations.

Trichloroacetic acid was discovered by Dumas, in 1830, and was prepared by the action of chlorine on acetic acid. It crystallizes in octahedra and deliquesces in the air. As this acid is decomposed by alkalies into carbonic acid and chloroform, Dr. Liebreich proposes to employ it as a substitute for chloral, but no account of his experiments is available to us at this present writing. If his reasoning were to hold good with this compound also it would go far to sustain his theory in reference to the splitting up of chloral and the local action of chloroform. The

whole subject is of great interest to physiologists and chemists, and may be the occasion of important discoveries.

NOTE.—The principal literature may be found in the following original papers :

Liebig Ann. Chem. Pharm.	I, 189
Staedeler, Ann. Chem. Pharm.	LXI, 101
Dumas, An. de Chim. Phys.	LVI, 123
Regnault, An. de Chim. Phys.	LXXI, 409
Wurtz., An. de Chim. Phys.	XLIX, 58
Kolbe, Ann. Chem. Pharm.	CVI, 144
Kopp, Ann. Chem. Pharm.	XCIV, 257
Kopp, Ann. Chem. Pharm.	XCV, 307

Medical Gazette, New York, November 6th, 1869 ; page 267.

—*New York Jour. of Applied Pharm.*, Dec. 1869.

ARSENIC IN THE SODA OF COMMERCE.

Dr. Fresenius calls attention to a fact, accidentally discovered by him, that the carbonate of soda (neutral), as met with in a crystalised state, and as manufactured at the alkali works, now often contains a very perceptible quantity of arseniate, or arsenite of soda, undoubtedly due to the use of sulphuric acid for converting the common salt into sulphate of soda, which acid contains arsenic, derived from the pyrites, of which few are quite free from arsenic, and some of which contain that substance in considerable quantity. The tests applied for the detection of this arsenic were not the most delicate in use for this purpose ; and the quantity found, though small, is sufficient to affect the purity of preparations for medicinal and chemical use.—*Chemical News*, Nov. 5, 1869.

TESTING ANTIMONY FOR ARSENIC BY THE MOIST WAY.

By M. RUMP.

The author states : During the latter end of last year, on the occasion of the inspection of apothecaries' shops in Prussia, a quantity of tartar emetic was found to contain arsenic ; as a

consequence thereof, a report was made to headquarters, at Berlin, and a rigorous inquiry and investigation set on foot by order of Dr. de Mühler, as minister for medical affairs and police (*medizinal polizei*). The methods of testing for arsenic, when mixed up with antimonial preparations, were carefully considered, and the following method of testing, due to the researches of Mine Inspector Strohmeyer, adopted: 2 grms. of the suspected tartar emetic are reduced to a fine powder and dissolved in 4 grms. of pure hydrochloric acid (sp. gr., 1.124). The glass vessel wherein this solution is made ought to be narrow, and capable of being well closed, and of sufficient size to contain an additional quantity of at least 30 grms. more of hydrochloric acid. A quantity of pure hydrochloric acid should be thoroughly saturated with sulphuretted hydrogen gas, and of this acid a quantity of at least 30 grms. is added to the solution of the tartar emetic. The glass vessel containing the solution is well corked, and, after having been shaken up, set aside; the turbidity which at first appears soon subsides (if it does not do so, it is due to the too great saturation of the HCl with HS, and should be remedied by the addition of some pure HCl). If no arsenic is present at all, the liquid remains perfectly colorless; but the slightest trace of arsenic gives rise to a yellow coloration, and very soon after to a perfectly perceptible pure yellow precipitate of sulphuret of arsenic.—*Chemical News*, Dec. 3, 1869.

ACTION OF DIRECT SUNLIGHT UPON IODIDE OF POTASSIUM.

By M. LOEW.

A solution of iodide of potassium is, even when kept in well-closed bottles, slowly decomposed by the action of daylight, and assumes a somewhat yellowish tinge, due to free iodine. The author filled a number of glass tubes for about from one-half to three-fourths of their capacity, with a solution of iodide of potassium, and, after having sealed these tubes, exposed them to direct sunlight. Another set of tubes were likewise filled with the same solution, but all air was expelled, and the tubes sealed

during and after the solution had been boiling for a considerable time. These tubes were also exposed to the action of direct sunlight; after three and four months' exposure, the tubes and contents were examined; those wherein no air at all was left were found to be perfectly colorless, no decomposition of the contents having taken place. As regards the other tubes, the following results are noticed: 1. Under the influence of light, the oxygen of the air decomposes iodide of potassium, iodine in small quantity is set free, while hydrate of potassa is found in the liquid. 2. This decomposition is limited, and does not, even when a large quantity of oxygen is present, increase, because a portion of the iodine set free enters again into combination with the caustic potassa set free, forming iodide of potassium and iodate of potassa. 3. The testing for ozone by means of a solution of iodide of potassium and starch (or paper prepared therewith), is of no value whatever, unless care has been taken to exclude direct sunlight.—*Chemical News*, Dec. 3, 1869.

Editorial Department.

OUR JOURNAL.—FORTY-SECOND VOLUME.—In commencing a new volume it is usual with many editors to offer some remarks apposite to the work in their charge. It is not often that we have taken advantage of this practice, but the present seems to offer a fitting occasion. Our readers will find an unusual amount of original matter in the present issue; in fact nearly the whole of it is the work of our contributors. Attention is particularly called to the valuable paper of Dr. Wormley, whose well known and extensive labors in toxicological chemistry cause this contribution to be highly appreciated. The view of Pharmacy in Sweden opened by Mr. Oldberg will gratify many by its plain, free style, and his feeling acquaintance with the subject. Swedish Pharmacy has been a nursery of great men in science; Scheele, the father of Organic Chemistry, passed through the routine described. Our friend Dr. Squibb treats us to one of his old-fashioned exhaustive articles on the preparation and titration of opium, as exhibited in his "*Liquor Opii Compositus*." He has substituted the disagreeable Hoffman's anodyne by chloroform and acetic ether, for reasons which he gives at length. Mr. Campbell gives a more explicit statement of his "method" of applying percolation in the preparation of fluid extracts. The evident interest excited by his former paper, published in our September issue, has not abated, as will be seen by com-

mentaries in this, an interest arising from the real importance of having our Pharmacopeia processes so manageable that they can be performed easily within the shop laboratory. We have not yet satisfied ourself of the actual necessity and value of making glycerin enter so generally into these preparations, nor do we yet appreciate whether its presence may be viewed as so much sugar, or whether it has certain physiological properties when administered that render its presence sometimes inappropriate. This is a point that medical observers would do well to determine.

Whilst on this subject we will take occasion to say that there are quite a number of our subscribers whose practice conveys the impression that printers and paper makers work gratuitously. There are some who owe us for eight and ten years of subscriptions, and yet expect to receive this number as though of right. This situation, it may be said, is our fault in sending. This may be true, but the course of our College in this, as in most others of its functions, has been rather to extend knowledge than to make money, depending on the just appreciation of its efforts in the long run to benefit Pharmacy. If some of this class of our patrons fail to receive this volume, they must attribute it to an earnest effort to reduce our expenses, rather than to a disposition to deprive them of their customary reading matter, and that, appreciating our sincerity, they will manfully pay up old scores, and bring smiles to the visage of our treasurer.

We will also take occasion to ask the attention of our subscribers to the mail service of their localities. Where several subscribers are at one place, our mailing clerk always, after writing the names on the covers, ties them together in paper directed to the postmaster. It frequently happens, under these circumstances, that, while nearly all receive the Journal, one will write of its failure, when, as a matter of course, the missing journal must have reached the post office. It is therefore the duty of subscribers to promptly investigate these failures to receive, because when we carefully mail them our responsibility ends. When subscribers move their residence from one post district to another they often forget to notify us, and thus occasion loss and trouble. In sending their address, each subscriber in small towns should specify his County as well as State, to give additional safety.

We owe an apology to our subscribers for the late appearance of this number, due partly from the necessity of waiting for the illustration at first page, which has not yet come to hand on Jan. 5th. Quite a number of excellent papers in our exchanges are waiting for notice or reprinting in our pages, and it is hoped that we will be able in the March number to do them justice.

JOINT ACTION OF MEDICAL AND PHARMACEUTICAL COMMITTEES IN RELATION TO A DRUG LAW.—In March last the County Medical Society appointed a committee, consisting of Doctors Gross, Burns, Stetler, Gebhard and Hamilton, to take some action in reference to the necessity of a law against

the adulteration of drugs, etc. This committee having invited the Philadelphia College of Pharmacy to appoint a similar committee to co-operate in the same object, that body responded by the appointment of Messrs. Procter, Parrish, Maisch, Taylor and Bullock. The joint committee on their first meeting determined to invite the College of Physicians of Philadelphia to take part in the work, which being acceded to, that College appointed Doctors Carson, Ruschenberger, Ashurst, E. Harts-horne and T. H. Bache. Subsequently, at the meeting of the State Medical Society, that body also appointed a committee, consisting of Doctors Nebinger, Mayburry, Cumisky, Knight and W. L. Wells.

This joint committee have met from time to time, and have discussed the business referred to them, more especially in relation to the necessity of a law to restrain and punish drug adulteration, and of an inspector to see it carried into effect. The pharmacutists, having been invited by the physicians, desired to know on what grounds their medical friends founded the necessity for such a law, and, on hearing the statements upon which it was based, took the ground that as regarded foreign *drugs* no such necessity existed, the government inspection at the ports of entry having to a large extent excluded the low grade of drugs formerly imported. In regard to the alleged deviations from the Pharmacopœia in making standard medicines by apothecaries, druggists, and manufacturing pharmacutists, it was admitted that such deviations did exist, and that want of uniformity was a great evil, arising from various causes, but chiefly from the attempts of manufacturers to produce these preparations by processes and formulæ less expensive than those of the National Code. They believed that the first duty of physicians and apothecaries was to make the National Code a true exposition of the present state of the pharmaceutic art, and in its materia medica to accord with the demands of the medical profession in all parts of the country. Then to insist on its recognition by physicians, pharmacutists and druggists. They did not think an inspector of drugs and medicines could possibly meet the difficulty, as, independent of the impossibility of analysing Galenical medicines successfully, it would involve so much time as to require an hundred inspectors for the State to carry out the law. They (the pharmacutists) therefore advocated measures tending to raise the status of pharmacy, and to confine its practice to qualified persons, by urging a law based on qualification sustained by registration. They also were willing to have a law making the adulteration of drugs and medicines a misdemeanor, provided it was to be carried out by the Courts through the aid of qualified and recognized experts, and not by the mere *ipse dixit* of informers, medical and otherwise.

The physicians of the joint committee, except in a very few instances, were not prepared to sustain the grave charges which a committee of the State Medical Society had made last winter to the Legislature, on the occasion of memorializing that body for a law with an inspectorship ; and,

after much discussion, it was finally agreed by the joint committee to recommend so much of the draft of a law suggested by the American Pharmaceutical Association in September last, at Chicago, as pertained to the adulteration of drugs. This came up for consideration at the meeting of Dec. 18th, at which too few were present to give force to the expression, and its consideration was postponed till Dec. 29th, when the following resolutions were passed, with a majority present, the first with one negative vote, the second unanimously:

"Resolved, That the Joint Committee appointed by the College of Physicians, the State Medical Society, the County Medical Society, and the College of Pharmacy, respectfully advise the several bodies which they represent that, in their opinion, the draft of a law proposed and considered by the American Pharmaceutical Association embodies a better plan than any other which has been brought to their notice, for the suppression of adulteration and sophistication of drugs and medicines."

"Resolved, That the expression of opinion of the Joint Committee, in the resolution just adopted, refers exclusively to those sections of the 'Draft of a proposed Law' which relate to the adulteration and sophistication of drugs and medicines."

CORRECTION.—NEW YORK COLLEGE OF PHARMACY.—In a paper on "Pharmacy in the United States," by Mr. John Faber, published in the September number of the American Journal of Pharmacy, page 399, the following paragraphs occur, relating to a law previously stated to exist in the State of New York:

By force of that law, the College of Pharmacy in New York, in the year of 1830, after having repeatedly fined, caused a number of establishments (the owners of which could not prove their legal qualification) to be closed. But they appealed to the Supreme Court of the United States, which declared this law unconstitutional, it being not in accordance with the general freedom of trade, as sanctioned by the Constitution of the United States.

On the strength of that decision, those that were thus interrupted in their business commenced an action against the College of Pharmacy of New York, which had to pay such heavy damages, that it took that institution over fifteen years to recover from it.

A letter received from Mr. George C. Close, President of the New York College of Pharmacy (and which should have been noticed in our last number), after saying that this whole statement is untrue, and that Mr. Faber has been misinformed, says:

"The first charter for the College was [granted] in 1831, and the act to regulate the preparation and dispensing of medicines in the city of New York was passed March 11th, 1839.

"The College of Pharmacy of New York never has taken any action towards enforcing this law, neither has any individual done so; and of course the appeal to the Supreme Court, and the subsequent action against the College, the fines, &c., had no existence except in the fertile brain of Mr. Faber's informant. The law of the State of New York referred to is defective, in directing the fines collected to be paid to an in-

stitution which has no existence under the title designated, and this perhaps is one reason that no attempt has been made to enforce it."

UNIVERSITY OF MICHIGAN.—The following letter was alluded to in our last number, but was received too late to afford space for it:

MICHIGAN UNIVERSITY, Sept. 24, 1869.

EDITOR AMERICAN JOURNAL OF PHARMACY:

Dear Sir,—Your September number contains a list of the graduates from the Michigan University School of Pharmacy, prefaced by some editorial comments. You say you "are not well assured of the preliminary requirements of this school as regards practical training in the shop, and hence do not know the real value of the diploma granted." Perhaps some explanation upon this point may be in order.

No requirement of training in the shop is made, either for admission to the course or for graduation. Our school believes it to be quite as well for the young pharmacist, better for his employer, and far better for the public, that scientific preparation for the drug business should *precede* experience in it. Some students enter our course after several years of shop experience; in consequence they have the advantage, in the college, of greater eagerness. Others graduate to engage for the first in the drug store; they have thereby the advantage, in their vocation, of a more enlightened experience. The course now established here embraces training, under supervision, at the prescription stand,—actual work, certainly as well deserving the credit of responsible experience for the pharmaceutical student as hospital practice does for the medical student. This training is valued as a means of binding principle to practice, but it is not allowed to take the place of more fundamental education. Our classes are assured that it is not our design to enable them, in the least possible time, to enter upon drug dispensing, but to prepare them for more responsible positions during life. It is our endeavor to educate scientific experts,—competent for drug assays, familiar with the toxical properties of medicines, habituated to accuracy, capable of professional truthfulness and earnest to maintain it,—not mere ready tradesmen in pharmacy, but such as shall be *worthy* of the often abused designation of pharmaceutical chemist. The facility in detail acquired during years of activity in a drug store has its value,—one in no danger of depreciation. Certificates of shop experience can be obtained, by good behaviour and old Father Time, upon sufficient authority without resort to the College.

"In this country the words Pharmaceutical Chemist have no meaning beyond the other terms used to express the business or profession of a pharmacist." In the definitions of American dictionaries, apothecaries, pharmacutists and druggists are those *engaged* in preparing, selling, buying drugs, while a pharmaceutical chemist is (constructively) "one *versed* in chemistry," "pertaining to preparing medicines," &c. Certainly druggists do style themselves pharmaceutical chemists if they choose, without regard to scientific education. And any man whose occupation

it is to devise and direct the building of bridges, aqueducts, &c., is a civil engineer, both by custom and the dictionary; but this fact does not lessen the significance of the College diploma of Civil Engineer. This School gives the diploma of Pharmaceutical Chemist, because, of customary terms, these best express the educational design of this School. The meaning of the diploma will depend, of course, upon the worth of the education. In choice of title we had no precedent; for our methods of study, and requirements, differ from those elsewhere preceding pharmacy graduation.

With a full appreciation of the invaluable work which has been done with young men engaged in the drug business by the Colleges of Pharmacy of the United States (would there were more of them!), it appears to us that something should *also* be done in the "Universities" of our country to educate for an avocation that must be scientific to be useful. Agriculture, Mechanics, Engineering, Mining, and almost every responsible occupation, whether mainly mental or manual, have their courses of liberal instruction laid out in our institutions of learning; courses embracing years of discipline in science, absorbing the entire time and energy of the student, and designed to precede business experience. We labor toward placing pharmacy in scientific hands; who welcomes our effort?

A. B. PRESCOTT, M.D.

IS GLYCERIN AND SAW DUST SPONTANEOUSLY COMBUSTIBLE?—The following letter from our friend Brown is worthy of a little thought. Our own experience furnishes no solution to the phenomenon, assuming the case to be, as the relator supposes, a mere mixture of glycerin and sawdust. Under these circumstances, by capillary attraction the glycerin would be extended over an immense surface of ligneous cell structure, presenting a large surface to the air in contact. Whether oxidation, resulting in visible combustion, takes place under these conditions, is the question. Can any of our readers throw light on it, yea or nay, or must the ignition be due to a match or other cause accidentally present?

LEAVENWORTH, KANSAS, NOV. 27, 1869.

DEAR SIR.—I wish to relate to you the following circumstance, that occurred in this city, and, as it seems to be a mystery to us, it may not be to you. A druggist here purchased from W. J. M. Gorden a box containing a number of lb. bottles of glycerin, packed in saw dust. Upon opening the box he found several of the bottles broken. After taking out all the perfect bottles, he put back the saw dust and nailed the box up, and placed it aside in his store. It remained there a day or two, when he discovered the box to be smoking, and upon opening it burst out in a flame and burned rapidly. He carried the box out in the street, and by the aid of water the fire was put out.

Query. What produced spontaneous combustion? A letter from Mr. Gorden states that it was packed in saw dust from the mill, and he never had heard of a similar case before. Would packing in damp saw dust, and fermentation going on, produce it?

Yours, truly,

R. J. BROWN.

Pharmacopœa Suecica. Editio Septima. Stockholmæ, 1869. P. A. Norstedt & Filii, Typog. Reg.; p. 275, 12mo.

Through the kind offices of Oscar Oldberg, of Washington, D. C., we have received a copy of this volume. It is in the Latin language; the *Materia Medica* and the preparations are arranged together alphabetically, as in the last British *Pharmacopœia*. The French metrical weights are adopted, the *gramme* being considered equal to 0.0023525 of the Swedish pound, which is equivalent to 425.0758 grammes. No measures of capacity are adopted; *all liquids are ordered by weight, and it is forbidden to dispense them by measure.* The *metre* is adopted as the measure of length, divided into the decimetre and centimetre. Temperature is measured by the centigrade scale, and by this scale the range for *maceration* is between 15° and 25°, and for *digestion* between 35° and 45°.

The nomenclature differs much from the simplicity of ours. In specifying salts the acid is mentioned first, as *Acetas Morphicus*, *Hyposulphis Natricus*, *Iodetum Hydrargyrosus*, *Sulphas Chinicus*. The parts of plants are expressed in the name, as *Bulbus Allii*, *Cortex Chinæ Calisaya*, *Flavedo Aurantii*, *Flores Caryophylli*, *Folia Sennæ*, *Fructus Anisi*, *Glandula Lupuli*, *Herba Lobeliæ*, *Radix Arnicæ*, *Ramuli Sabinæ*, *Rhizoma Zingiberis*, *Semina Myristicæ*, *Stigmata Croci*, *Stipites Dulcamara*, *Tubera Jalapæ*, *Gummi Resinæ Asa Fœtidæ*. Any liquid oleo-resin is called a balsam, whilst Benzoin is called *Resina Benzoe*. Opium in all preparations is indicated by an adjective derived from the word *thebaicum*, thus—*Tinctura Thebaica*, *Trochisci Glycyrrhizæ Thebaici*, *Vinum Thebaicum Crocatum*, *Pulvis Ipecacuanhæ Thebaicus*, *Acetum Thebaicum*. Solutions are indicated by the prefix *Solutio* instead of *Liquor*. Volatile oils are *Ætherolea*. Under the name *Nitras Argenticus Mitigatus* a fused mixture of equal parts of nitrate of silver and nitrate of potassa is indicated, whilst *Nitras Argenticus Bis Mitigatus* contains two parts of the potassa salt. Tartar emetic is *Tartras Stibico Kalicus*.

The formulæ appear to be gotten up in a careful and practical manner, and so far as examined are judicious and closely allied in many instances to our own; yet there are many peculiarities, some of which are noticed here, viz.: Ammoniac plaster is made from one part of ammoniac and two parts of vinegar of squills. Electuary of senna consists of powdered coriander 1, powd. senna 10, pulp of tamarind 15, syrup 25. There is a class of extracts made into powder with liquorice root, thus: Take of the extract and liquorice powder equal parts, mix intimately, and dry on a porcelain plate between 40° and 50° Cent., then add sufficient liquorice powder to restore the weight lost by drying, and triturate to a fine powder. This form is very convenient in prescribing powders, is uniform in strength—two grains representing one of the normal extract. The pulverized extracts of aconite root, belladonna, cannabis, conium, digitalis and hyoscyamus are thus prepared.

Under the head of *Pulveres Simples* are some general observations in relation to the powders of simple drugs. These are divided into four classes: 1st. Those which pass through a silk sieve of 40 meshes to the centimetre (= 100 per inch), of which there are two kinds: A, those powdered without residue, as aloes, cinchona, gamboge, rhubarb, &c., and B, those powdered with a residue, as digitalis, hyoscyamus, senna and ipecac.

The second class pass a sieve 32 meshes to the centimetre (72 per inch). The third class through a sieve 18 meshes to the centimetre (45 per inch). The fourth class are made with a wire sieve, 10 meshes to the centimetre, or 25 per inch, such as flax seed and black mustard,

There are about 19 syrups, among which is the following singular formula for syrup of squills, which we quote verbatim as a sample of the text, viz.:

“*SYRUPUS SCILLITICUS* (sjölök syrup).

Rec. *Rhizomatis Zingiberis* *partem unam* 1

Bulbi Scillæ *partes duas* 2

Herbæ Hyssopi *partes quatuor* 4

Contusa et concisa in vase clauso per diem noctemque macerantur cum

Aquæ Menthæ piperitæ tanta copia

ut liquor exprimendo colatus et filtratus pondus habeat

partium triginta quinque 35

quæ cum

Sacchari Albi *partibus tribus et sexaginta* 63

Calore leni adhibito in syrupum convertantur.”

This formula also serves to show the plan of bringing forward the ingredients in a formula as the manipulation requires them.

The only *modus operandi* for tinctures is maceration for five days in a close vessel, with occasional agitation, followed by expression and filtration. The method of percolation as understood here is not mentioned in the work.

Among the ointments *Unguentum Cetacei* has the synonym of “Cold Cream,” and is prepared thus: 4 parts of white wax, 5 of spermaceti, and 28 of oil of almonds, are liquified by a gentle heat, and agitated in a warm mortar with 12 parts of rose water, until cool. 4 parts more of almond oil are then added, and the mixture beaten to a soft very white ointment.

Unguentum Glycerini is Schacht’s glycamyl, made by heating 2 parts of starch, 1 of water, and 10 of glycerin until the mixture becomes translucent.

A peculiarity of this *Pharmacopœia*, also noticed in some German codes, are tables relative to the doses of medicines and poisons.

Table A exhibits the maximum dose, for an adult, of powerful medicines.

Table B exhibits medicines which are not to be dispensed except on the prescription of a physician or by permission of the proprietor, and which are kept in locked closets.

Table C indicates medicines which are not to be dispensed except by prescription or permission, and which are kept separate.

Table D enumerates the medicines which are not required to be kept unless previously prescribed by a physician.

The names of all poisons are written with a sign, to indicate their nature.

Some of these tables are worthy of adoption here, and the whole work shows a care and precision in details regarding poisons that must go far to prevent accidents in Sweden.

Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution for the year 1868. Washington: Government Printing Office, 1869; pp. 473, octavo.

The policy of the Smithsonian Institution has greatly changed within a few years past, and from being destined to become a vast accumulation of books, and a museum of scientific objects and natural history collections, requiring all its income to keep them in order, now seems likely to carry out the design of its founder, by using its income to increase and diffuse knowledge in accordance with the views of Prof. Henry and some others. The original bequest was \$541,379.63, which, by careful management of the interest, is now a capital of \$697,000, giving an income of \$40,820.

The Library of the Institution was last year incorporated with that of Congress, in the Capitol. During the present year the herbarium, embracing between 15,000 and 20,000 specimens, has been transferred to the care of the Department of Agriculture. This collection, on which Professors Torrey and Gray have spent much time, it is to be hoped will be properly cared for and increased. The conditions of the transfer are that the botanist in charge shall be approved by the Institution, that it shall be accessible to the public for practical or educational purposes, and to the Institution for scientific investigation or for supplying information to correspondents.

A recent arrangement with the Surgeon General transfers the large collection of human crania belonging to the Institution to the museum under his charge, whilst it receives in return the ethnological collection of the medical museum.

The collections of type specimens of insects belonging to the Institution have been placed in the hands of entomologists for arrangement and study, to be reclaimed when required; thus carrying out the same line of policy above alluded to.

The general appendix, comprising four-fifths of the book, includes Flouren's memoir of Cuvier, translated by C. A. Alexander; Elie de Beaumont's memoir of Oersted, translated by the same; Hagen's memoir of Encke, and Rawson's memoir of Eaton Hodgkinson. Besides these, recent information in relation to the mechanical theory of heat, radiation,

meteorites, etc., etc., and the proceedings of various Societies, the publication of which is in accord with the object of the Smithsonian Institution as a disseminator of knowledge.

Proceedings of the British Pharmaceutical Conference at the Sixth Annual Conference, at Exeter, 1869. London; pp. 87, 8vo.

The publication, almost entire, of these proceedings in the *Pharmaceutical Journal of London*, has enabled us to anticipate the reception of this volume in our notice of the meeting, at page 571 of the November number. The list of members and general index to the proceedings heretofore published, from 1864 inclusive, with title-page for a general volume, are valuable additions to the matter published before. Several papers of great interest we hope to introduce into this volume, (which have been excluded by the large amount of original matter presented), especially that of Mr. Schacht, which offers views in relation to pharmaceutical education well worthy of attention this side the Atlantic. Mr. Stoddart's application of spectral analysis to pharmacy in recognizing Galenical preparations, opens up a new method of recognition, the value of which deserves study, however little apparent promise it may offer at the outset. We have always deemed these meetings of the highest value in stimulating British pharmacutists to increased efforts, and in raising the ideas of "provincial" members to a level with those of their more favored brethren of the Metropolis, so that they may appreciate the intentions of the late Act of Parliament as an agency to elevate and educate all who practice Pharmacy.

Journal of a Botanical Excursion in the North Eastern parts of the States of Pennsylvania and New York during the year 1807. By Frederick Pursh. Philadelphia, 1869; 87 pages, 12mo.

The manuscript of this little volume belongs to the American Philosophical Society, who received it from the executors of the late Dr. Benj. S. Barton, with other papers, but without the name of the author. Mr. Thos. P. James, when acting librarian of the Society, noticed the MS., and, aided by the suggestions of a friend, succeeded in identifying it as the journal of Pursh. The excursionist was aided by Dr. Barton with funds, and his journal is written in a peculiar quaint style, indicating an imperfect acquaintance with English. The editor has rendered it literally, that none of its interest may be lost. The name of Pursh is well known in connection with the Botany of the United States, and this account of one of his journeys in developing the flora of this country will be valued by all who take an interest in Botany and its cultivators.

Report and Remarks on a Third Series of 100 cases of Cataract Extraction by the Peripheric-Linear Method. By H. Knapp, M.D., &c., &c. New York: William Wood & Co., 1869; pp. 29, octavo.

A Contribution to the Physiological Study of Veratrum Viride and Veratria, (with Experiments on Lower Animals, made at La Grange Laboratory, 1869). By R. Armory, M.D., and S. G. Webber, M.D. Reprinted from the Boston Medical and Surgical Journal. Boston, 1869; pp. 66, 12mo.

The authors start out with the statement that "Veratrum Viride was not brought into notice until a little more than two years ago," which is strange when it is recollected that Dr. Tully and others had written of it, not to speak of the great advertising its properties received through the exertions of Dr. Norwood, of South Carolina, some dozen or more years ago, who claimed for it unequalled sedative powers. They also appear to be wholly unacquainted with the investigations published in the volumes of this Journal for 1865-66, showing the existence of *two* alkaloids in Veratrum Viride, and evidence that neither of them is Veratria. The authors do not state whether they used *pure* Veratria or the mixed alkaloids of commerce sold under the name. Some of the physiological experiments appear to have been loosely performed. *

A Pharmacopœia, including the outlines of Materia Medica and Therapeutics; for the use of practitioners and students of veterinary medicine. By Richard V. Tuson, F.C.S., Prof. of Chem. and Mat. Med. at the Royal Veterinary College, &c. London: John Churchill & Sons, 1869; pp. 311, 12mo. From the publishers.

The reader on opening this work might readily imagine it the British Pharmacopœia, until he came to some classes of preparations of special veterinary character. Judging from the men on whom a large portion of veterinary practice of this country devolves, we think this work is far too technical and scientific, however well it may be appreciated by the graduates of foreign veterinary schools. The nomenclature is in Latin, and is either that of the London Pharmacopœia or shaped on the same principle. The formulæ are often identical for preparation, but for such as enemas, bolus, etc., the quantities are increased to suit the greater demand of the animals treated. We see none of the outlandish mixtures so often heard of for dosing animals, and it would appear that modern European veterinary therapeutics approximates that applied in human practice.

Annual Report of the Surgeon General, U. S. Army, 1869. Printed at the Surgeon General's Office; pp. 11, octavo.

This report of Surgeon General Barnes gives an account of the health of the army during the past year, and especially describes the occurrence of yellow fever at Key West, Florida, in June last, which on its discovery was greatly mitigated by the removal of a part of the troops, and the establishment of strict quarantine regulations. The disease is attributed to refugees from Cuba. Much credit is given to the medical officers in charge. The Army Medical Museum continues to be augmented, and

the Medical and Surgical History of the War is slowly but surely progressing. The solid and permanent manner in which these new features of the medical department of the army are being carried out is as creditable to the Medical Bureau as it is to the indefatigable exertions of the officers and surgeons in charge.

The Pathology of Bright's Disease. By Wm. B. Lewis, M.D., &c., with illustrations. New York: Turner & Mignard, 1869.

Eulogium on Thomas C. Brinsmade, M.D. Read before the Rennselaer County Medical Society. By Geo. C. Hubbard, M.D. Albany, 1869, &c.

From the Author.

Constitution, By-Laws, and Code of Ethics of the Philadelphia College of Pharmacy, with lists of officers, committees, members and graduates, and the announcement of the School of Pharmacy. Pp. 56. 1869.

This pamphlet, the result of much labor during the past year, is sent to the members of the College with this number, and, as far as possible, to the associate, honorary, and corresponding members, and the subscribers. As several important changes have occurred in regard to membership, and a new class of foreign members created, it should be closely examined by all interested.

OBITUARY.

GEORGE PEABODY.—This eminent patron of science and education died in London, November 4th, 1869, in his 75th year. A Massachusetts man by birth, and attached to his native soil, Mr. P. spent most of his life away from it, the earlier portion in Baltimore and the latter in London, where, chiefly as merchant, and afterwards as banker, he acquired the immense fortune, the judicious disposition of which, during his life, for educational and philanthropic purposes, has won for him the respect and admiration of the old world and the new. These gifts were scattered through a period of seventeen years, but it was only in the latter portion of his life that his enlarged views took shape, in regard to the London poor and to scientific and educational institutions in this country. Nations have vied to honor his memory.

DR. FREDERICK PENNY, Professor of Chemistry in the Andersonian Institution since 1839, died recently in Glasgow, Scotland. Numerous papers record his researches.

PETER V. COPPUCK, of Mount Holly, N. J., died on the 29th of December, 1869, in the 64th year of his age. He was an apothecary in good repute in his locality, was an associate member of the Philadelphia College of Pharmacy, a member of the American Pharmaceutical Associa-

tion, and has been in business about 41 years. He was a useful and public spirited citizen and much respected in the community where he resided.

PIERRE-FRANÇOIS-GUILLAUME BOULLAY, Dean of the Imperial Academy of Medicine, Honorary President of the Society of Pharmacy of Paris, and one of the founders of the *Journal de Pharmacie*, died at Paris in about the first of November last, aged 92 years. According to M. Buignet, from whose address we draw most of the following facts, M. Boullay was born at Caen, of an honorable protestant family, and commenced his education at the College there, but his studies were interrupted by the revolution. He commenced his career as pharmacien with M. Mezaize, at Rouen, then with M. Bacoffe, of Paris, and entered the laboratory Vauquelin through the recommendation of Valmont, Bomare and other savants, where he availed himself largely of the advantages his position under this great master afforded, and at the age of twenty gained the first prize in chemistry. He founded a pharmacy in Paris, in 1798, which became a noted center, and in 1803 became a member of the Societé de Pharmacie. In 1809, in company with MM. Boudet, Planche, Cadet and Destouches, he founded the *Bulletin de Pharmacie*, which, in 1815, became the *Journal de Pharmacie*, which has continued to the present time. Various of his researches mark the pages of this great serial. He was the discoverer of picrotoxin, and in connection with his son, the late Polydore Boullay, developed and applied the *methode de déplacement* to pharmacy. This, more than any other of his labors demands the regard of Americans, as here more than anywhere else has this valuable process been applied in pharmaceutical manipulation. In 1820 he became a member of the Académie de Médecine, and was the last of its founders.

As a Pharmacien M. Boullay was noted for conscientiousness and probity. He did not accept the responsibility of a medicine unless he prepared it himself. His laboratory was always busy, and became a school in which many eminent pharmaciens commenced their career. M. Boullay was a member of many learned societies, and last year was elected an honorary member of the Philadelphia College of Pharmacy, as he had previously been of the American Pharmaceutical Association.

On the preliminary organization of the International Pharmaceutical Congress, held at Paris, in August, 1867, M. Boullay was elected temporary president, and his venerable appearance, then in his 90th year, graced that honorable position.

The character of M. Boullay was full of dignity and greatness of soul, and though jealous of the prerogatives due to his age and long experience, his urbanity was carried in all his relations, and caused the general esteem of those who knew him.

**Catalogue of the Class of the Philadelphia College of Pharmacy,
FOR THE FORTY-NINTH SESSION, 1869-70.**

With a List of their Preceptors and Localities.

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Cause, Emiliano.	St. Iago,	Cuba,	
Chiles, Edward,	Frankfort,	Kentucky,	Charles Shivers.
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ON THE PREPARATION OF LIQUID PEPSIN.

BY EMIL SCHEFFER, of Louisville, Ky.

At the suggestion of a physician to make a preparation of Pepsin from the stomach of the pig, I was induced to make a variety of experiments, which I wish to bring to the notice of the readers of this Journal, and particularly those of the medical profession.

Throughout my experiments I employed the finely-chopped mucous membrane, which I dissected from fresh, well cleaned pig's stomach. The first experiment was made by macerating the membrane with water, straining off the liquid, adding hydrochloric acid and subsequently glycerin, the latter partly to give it consistence, but principally on account of its antiseptic properties. The experiment was repeated a number of times, changing the proportions of membrane and menstruum; but it was found that by maceration with water alone too much mucus was dissolved, so that the liquid became quite gelatinous and did not clear itself, and therefore this process was abandoned. I next macerated the membrane in water, acid and glycerin mixed together, and obtained a preparation from which, on standing a few days, the mucus held in suspension was precipitated and was entirely separable by filtration, forming a clear liquid. At the same time the preparation loses a peculiar disagreeable odor, which seems to be characteristic of the mucus. This odor seems to be developed during the maceration of the membrane, as the fresh stomach does not possess more odor than fresh pork, and that this odor is peculiar to the mucus is evinced by the

liquid losing it in the same degree as the mucus precipitates. Upon these and subsequent experiments I have based the following formula for

Liquid Pepsin.

6 pounds mucous membrane of hogs' stomach are macerated
in a mixture of

4 pounds glycerin,

4 pints water and

6 ounces of pure hydrochloric acid,

for thirty-six hours, after which the mass is put on a strainer, and when the liquid has drained, the membrane is macerated again with three pints of water for two or three hours, then strained, and this proceeding repeated with smaller quantities of water until ten pints of liquid are obtained.

The resulting liquid will be found mucilaginous, very turbid and of a strong disagreeable odor. After standing a few days, however, the liquid becomes limpid, a precipitate of mucus forms and, by filtration, a clear light straw-colored liquid is obtained, possessing a faint and disagreeable odor. Liquid Pepsin, properly prepared according to the above formula, is of such strength that one fl. oz., is capable of dissolving one and a half drachms of coagulated albumen, which of all albuminous and fibrinous substances I considered the best adapted for ascertaining the strength of an artificial gastric juice. This test was made by adding coagulated albumen, cut into small cubes, to one fluid-ounce of liquid Pepsin, keeping the fluid at a temperature of one hundred to one hundred and five degrees, and shaking it from time to time, until the albumen was dissolved. By repeated experiments with at first smaller quantities I found that one and a half drachms of coagulated albumen will dissolve in one fluid-ounce of liquid Pepsin in from four to six hours. Care must be taken in conducting this test, that the temperature does not rise much higher than 105°, which in all probability would injure the solvent power of Pepsin, and when heated to the temperature of boiling water I have found it, by actual experiment, to lose all action on albumen. I would here remark, that albumen boiled two days before its use for experiments was dissolved much slower than when freshly coagulated. Being now

fully satisfied that the Liquid Pepsin had digestive power, that is, that it contains Pepsin, I undertook to examine some of the Pepsins and preparations of Pepsin usually found in our market, in order to compare their solvent power upon albumen with that of my own preparation. In order to control the experiments, and to prevent errors from the difference in solubility of coagulated albumen boiled at different times, I accompanied each experiment with a proof test. This consists in exposing one and a half drachms of coagulated albumen to the action of one fluid-ounce of my liquid Pepsin simultaneously with the other Pepsins, subjecting thereby each fluid to the same temperature, and shaking one vial as often as the other one, until the albumen in my Pepsin was dissolved. This period I shall call "the end of the process."

Wine of Pepsin, prepared from the mucous membrane of the pig's stomach with sherry wine, was first tested. One drachm of coagulated albumen was subjected to the action of one fluid-ounce of Wine of Pepsin.

The albumen did not dissolve, seemed on the contrary to get more compact, and the wine kept clear, while by all other experiments, where solution of albumen takes place, the fluid becomes turbid.

At the end of the process the albumen was taken out of the wine, washed with water, dried on filtering paper and then weighed. The one drachm had lost only fifteen grains, which loss I do not consider as having been dissolved, as the albumen was firmer than before it was put into the wine, and felt like soft india-rubber between the fingers. I am confident that the loss is owing to water, which the albumen lost by the process. To determine whether the alcoholic strength of the Wine of Pepsin prevents the solution of albumen, the foregoing experiment was repeated, with the difference that one fluid-ounce of the wine was diluted with its volume of distilled water, but the result was precisely the same.

The same result was obtained with another portion of my own Wine of Pepsin, with Wine of Pepsin prepared by a friend, with Wyeth's Wine of Pepsin and with Wyeth's Elixir of Pepsin.

A fresh portion of mucous membrane was now extracted with

sherry wine by maceration for eight days, after which time the membrane was removed and employed to prepare liquid Pepsin according to the formula given above. The resulting preparation was found capable of dissolving one drachm of coagulated albumen, rendering it evident that wine had taken up little or none of the active principle of the mucous membrane.

By making the Wine of Pepsin the mucous membrane does not swell up, as this is the case when liquid Pepsin is made; on the contrary it seems to contract; therefore I believe that the alcohol in the wine coagulates the albuminous substances of the membrane. The quantity of alcohol in sherry wine seems likewise sufficient to prevent the Pepsin from being dissolved. To prove this assertion I added to one fluid-ounce of liquid Pepsin a mixture of half a fluid-ounce of alcohol and one and a half fluid-ounces of distilled water, thus forming a liquid containing sixteen per cent. of alcohol, about the percentage of good sherry wine; which mixture, at first quite clear, became after a short time opalescent, cloudy, and after thirty-six hours flakes of Pepsin had separated. The flakes were collected on a filter, drained, then dissolved in water acidulated with muriatic acid, and with a certain quantity of coagulated albumen exposed to a temperature of 105° . This experiment was controlled by another one, in which the same quantity of albumen was added to the same quantity of water and muriatic acid. After several hours, at least three-fourths of the albumen in the experiment which contained the flakes had disappeared, while in the other one the albumen was not acted upon, thus proving beyond doubt that the flakes were indeed Pepsin.

After these experiments I do not hesitate to say, that the so-called Wine of Pepsin does not contain any Pepsin at all, and that all the medical virtue of it has to be attributed to the wine itself.

Boudault's French Pepsin.

A. To one-half drachm mixed with one fluid-ounce of water was added one drachm coagulated albumen.

B. To one-half drachm mixed with one fluid-ounce of water and fifteen drops of pure muriatic acid, was added one drachm coagulated albumen.

At the end of the process the undissolved albumen was taken out, washed and dried from adhering water on bibulous paper, and then weighed.

A. had lost twenty-four grains.

B. had lost twenty-seven grains.

That in these two cases a solution of albumen had taken place was plainly seen, as the remaining albumen was quite soft and by the least pressure formed a pulpy mass.

Houghton's Dry Pepsin—made from calf rennet.

a. One drachm of Pepsin, one fluid-ounce of water, and one drachm of coagulated albumen.

β. One drachm of Pepsin, one fluid-ounce of water, fifteen drops of muriatic acid and one drachm of coagulated albumen.

At the end of the process,

a had lost nothing; the consistence of the albumen was about the same as before it was put into the solution.

β had lost ten grains.

The remaining albumen was somewhat softer but not as pulpy as by the French Pepsin.

Hawley's Liquid Pepsin. Of one and a half drachms of coagulated albumen, which were put to one fluid-ounce of this preparation, at the end of the process one drachm and ten grains were undissolved, but it showed itself considerably softened.

According to these experiments, one fluid-ounce of liquid Pepsin would be equal in strength to one drachm and forty grains of Boudault's French Pepsin, to nine drachms of Houghton's dry Pepsin, and to four and a half fluid-ounces of Hawley's liquid Pepsin.

The various wines which were tested cannot be classified with the Pepsin preparations, as they evidently contain no Pepsin.

So far the experiments about my preparation proved satisfactory, but the question had to be answered yet, if in course of time, particularly in warm weather, the liquid Pepsin does not undergo any decomposition and thereby lose some of its medical virtue? To find this out, a vial with liquid Pepsin was placed in the neighborhood of the warm stove for five weeks and then examined again. The external appearance was entirely

the same; the color only seemed to have become a little lighter, the odor had entirely disappeared, and, by testing for its strength, the result showed that it had lost none, as one fluid-ounce dissolved still one a half drachms of coagulated albumen.

Before concluding, some remarks on the proper form of exhibiting liquid Pepsin may not be out of place. Some physicians and druggists to whom I have spoken, expressed themselves in favor of elixir or wine, believing it would thereby be more pleasing to the palate. That the liquid Pepsin prepared in the above way is a clear liquid, not objectionable to the eye or palate, I have related above; and the faint odor which it has when first prepared is so trifling, that those who are compelled to take such a medicine do not care for, when they find relief by it. A physician may add something to it to change the color and taste whenever he prescribes it, and in this case I would suggest some aromatic syrup; but to add alcohol to it and make it up in form of an elixir, I am, by my experiments, utterly opposed to. A medicine pleasing to the eye and agreeable to the palate is no doubt more acceptable to the patient, but when, as in many cases, the real value of a medicine has to be sacrificed to the external appearance, it ought to be discountenanced.

Louisville, Ky., January, 1870.

NOTICE OF M. CARRE'S APPARATUS FOR MAKING ICE.

BY THE EDITOR.

A few weeks since we had the pleasure of visiting this apparatus in full operation at the machine works of Messrs. I. P. Morris & Co., of Philadelphia, where this firm have erected it under the supervision of the American representative of the patentee, Mr. Bujac, of New York. It will be recollected by some of our readers that M. Carré's invention consists in the use of ammoniacal gas liquified by pressure, as his agent for freezing water, which it does by abstracting and rendering latent the heat of the water necessary to its liquid condition. The manner of using the ammonia to effect this purpose is exceedingly ingenious, and apparently paradoxical, inasmuch as heat is applied to produce cold; and this is the chief claim of originality made

by the patentee, who also claims the application of the power of absorption due to mutual affinity as a means of producing vacuo, volatilization, the removal of heat, and the consequent production of cold. This machine is called "Jack Frost, Jr."

Although the apparatus is complex, it does its work well, and makes three tons of ice per day when in constant operation. Without an outline engraving it will be impossible to convey to the reader a correct idea of its details, involving as they do much tubing; yet we will endeavor to describe its principal features. It may be premised that the form of ammonia used is the concentrated aqua ammoniæ, containing 26 per cent. of gaseous ammonia, and that there is a constant pressure in the apparatus when in full operation of about 200 pounds to the square inch, or thirteen atmospheres.

The apparatus consists (1) of a cylindrical, dome-topped, vertical *boiler*, about 9 feet high and $2\frac{1}{2}$ in diameter, into which 250 gallons of the ammonia are introduced, part of which enters the exchanger, the complement and the absorption vase, to be described. A large tube issuing from the dome connects it with (2) the *liquefactor*, which is an extensive series of connected, nearly horizontal tubes, contained in a sheet-iron tank filled with cold running water. In this the gas, under the great pressure and the cold, is liquefied, its latent heat being carried off by the cold water, whilst the liquid ammonia passes out at the lowest end by a small tube into (3) the *recipient*, where it collects. This vessel is connected by a tube with (4) the *distributing valve*, which distributes it, by means of six small tubes of 1-16th of an inch calibre, into six stacks of zig-zag tubes, contained in the *freezing cistern*. The freezing cistern consists of a wooden tank lined with iron, about five feet long, three wide, and three deep, in which are placed six lines of vertical zig-zag tubes above noticed, into which the liquefied ammoniacal gas enters from the distributing valve. Between these, forty-eight copper cans or freezers, filled with water, are placed, and the whole interior of the tank is filled with a bath of strong brine, or, preferably, solution of chloride of calcium, which is incapable of being frozen by the temperature produced, and is made to circulate between the tubes and freezing cans as a carrier of heat, by a stirring

apparatus. The stacks of zig-zags connect at bottom with a cylindrical vessel called *the collector*. When now the distributing valve is partially opened, the liquid ammonia is forced in due proportion into the zig-zag tubes, where it rapidly expands into gas by the assumption of the heat necessary for its vaporization from the surrounding brine, which in its turn abstracts the heat of the water in the cans (by virtue of which only it can retain its fluidity), and thus converts it into ice and accomplishes the chief purpose of the machine. But the apparatus, acting continuously, now gathers the resulting ammoniacal gas, redissolves it in the weak liquor of the boiler which it has previously abstracted and cooled, and then returns it to the boiler to be again deprived of its gas. This remarkable compound result is effected in this wise: The ammoniacal gas, after performing its office of rendering latent the sensible heat of the water, passes on first to the collector, and from this through a cooling tube to the *absorption vase* (which consists of a cylindrical vessel enclosing a tall coil of tube, through which passes a constant current of cold water); and there, after the machine has been working some time, it meets with the exhausted ammonia liquor, by which it is rapidly absorbed, and which thus regains its original strength. The manner in which the weak ammonia liquor reaches the absorption vase, and the regenerated liquor ammoniæ is returned to the boiler, all of which has to be effected under the heavy pressure of thirteen atmospheres, is as follows: By a syphon tube reaching to the bottom of the boiler the latter is connected with the double coil of the *exchanger*, which consists of a tall cylindrical iron vessel, about twenty inches in diameter. The lower end of the coil is connected with the lower end of another coil in a similar vessel beside it, called the *complement*, the upper end of which coil enters the absorption vase at the top, and descends nearly to the bottom. At first the boiler, exchanger, complement, and absorption vase are all charged with strong ammonia, but as soon as the heat under the boiler has driven off sufficient gas to create strong pressure, the weakened hot ammonia liquor is forced into the coil of the exchanger, where it is partially cooled by the cold ammonia of the absorption vase, which the pump has forced into the cylinder of the exchanger, ready to

replace the weak liquor in the boiler. The weak liquor is then perfectly cooled as it passes through the *complement* coil, which is surrounded by very cold water, and it enters the absorption vase, rapidly absorbing the gas entering from the collector, and reproducing aqua ammoniæ. Simultaneously the forcing pump of the machine is drawing the cool strong ammonia from the upper stratum in the absorption vase, and forcing it into the cylinder of the exchanger, where, after performing its office of cooling the weak liquor and becoming itself heated, it passes into the boiler near its top, impinging on a series of porous diaphragms of metal suspended in the upper part of the still, to facilitate the rapid separation of the gas a second time. Thus it is apparent that the same aqua ammoniæ may be used over and over again, to an extent only limited by the perfection of the joints under the great pressure constantly existing.

At starting the machine, all the cans are filled with pure water and closely covered with wooden lids, and when, after about four hours, they are frozen, the operator removes the ice from the *first, third, fifth, seventh, &c.*, one every five minutes, until he has reached the *forty-seventh*, refilling each with water and returning it to its place as he goes, when he takes the series two, four, six, eight, ten, &c., to the forty-eighth, in the same way, when the other series is re-commenced, and so on day and night, making three tons every twenty-four hours. Mr. Bujac says that on the 24th of October, 1869, an experiment with this machine yielded 2204 lbs. in eight hours, with a gain of 11° C., the bath being 6° below zero C. at 8 o'clock, A. M., and 17° C. below zero at 4 o'clock, P. M.; and he thinks the product would reach 7000 to 7500 lbs. in twenty-four hours if the boiler and tubes were covered with felt. To remove the ice, the cans are dipped momentarily in hot water, and then inverted. The cakes are uniformly rectangular, and as their temperature when removed is far below 32° F., by simply moistening their surface they cement perfectly to each other, and form solid blocks of ice of any required dimensions.

Mr. Bujac had a shallow tank of wood, ten feet by thirty feet, arranged with a series of iron pipes just below the surface of the water it contained, when on attaching the machine the water was

frozen so that boys skated upon it. The idea of applying the machine to the reduction of the temperature of large rooms for brewers and others who need a moderate heat in their processes, is at present being studied practically. We understand a machine like the one described is worth \$12,000, and when worked constantly will make about one thousand tons of ice per annum. Machines of ten tons per twenty-four hours capacity are now at work in New Orleans, the price of which are \$25,000.

Philadelphia, Feb. 10, 1870.

ON THE REACTION BETWEEN SPIRIT OF NITROUS ETHER AND BICARBONATE OF POTASSA.

By C. J. RADEMAKER, M. D.

Always preparing sweet spirits of nitre according to the process of the U. S. P. and keeping it standing on crystals of bicarbonate of potash, as first suggested by Mr. Harvey, of Leeds, I invariably observed a molecular change taking place in the crystals of bicarbonate of potash, without any perceptible solution taking place. The irregular eight-sided prisms of bicarbonate of potash gradually elongated themselves into needles about one inch in length. In order to find the cause of the molecular change, part of the crystals were collected on a filter, and washed with distilled water until all taste of nitrous ether was removed. The crystals were transferred to a beaker, and treated with concentrated sulphuric acid; which was attended with an evolution of a large quantity of gas, which became red fumes of hyponitric acid as they ascended.

From the above it will be seen that spirits of nitre will decompose bicarbonate of potash, with the formation of nitrite of potash, carbonic acid, and ether, without any perceptible solution taking place.

The ether with which the experiment was performed was perfectly neutral, as it had been distilled from bicarbonate of potash two and three times; for that reason no acidity could have been the cause of the decomposition. A solution of bicarbonate of potash added to one of spirits of nitre there is a ready decomposition, with the evolution of carbonic acid, formation of nitrite of potash and ether. Nitre, as prepared by some of our chemists

on a large scale, is made to pass through a solution of alkali kept at the same temperature as that of the retort in which the nitre is generated, in order to free it from aldehyd. To this is probably owing the small amount of nitrous ether found in the spirit of nitre of commerce.

Louisville, Jan. 30th, 1870.

NOTE ON AN IMPURITY IN TINCTURE OF CHLORIDE OF IRON.

BY J. C. WHARTON.

To the Editor of the American Journal of Pharmacy :

Dear Sir,—Some four or more years since I addressed to you an article upon the subject of muriated tincture of iron, and, if I mistake not, the same was published in the American Journal of Pharmacy for the month of November, 1865. I then made the statement that I had obtained a crop of singular crystals from a lot of the tincture. Since then I have seen nothing in any journal or circular that explained the production of the substance in question. I am glad to state that I have at last gained a clue to the subject, and will in the outset say that I am fully convinced that the crystals are derived from the *glass vessel* in which the solution of iron is effected. A small amount of the vessel is dissolved (either from glass or porcelain ware), and crystallizes out of the solution in the form of silky white needles of a lustre something like asbestos.

I must confess that soon after I made the announcement above mentioned, I was afraid that I had obtained the substance from some unknown and accidental impurity in the materials used, especially as I did not find it in another lot of tincture, neither could I find another druggist whose observations gave me any reason to believe that such a crystallization was at all common,—the reason for which I now comprehend, as the substance does not always appear in crystals, and sometimes not at all; but most frequently is left behind either in the filter or in the dregs from which the supernatant clear solution of sesquichloride of iron is drawn previous to the addition of the alcohol.

When it is to be found in the tincture at all, it is most apt to

be in the form of a yellowish precipitate at the bottom of the bottle containing it. This is the same, or a part of the precipitate called in the U. S. P. sesquioxide of iron; by some other authorities, a basic oxide or chloride of iron. I am not prepared to say that the precipitate commonly noticed in the tincture of iron, as obtained by the subcarbonate process, is not *sometimes* a pure sesquioxide of iron, occasioned, as stated in the U. S. P., by the change of a small amount of protochloride to sesquichloride and sesquioxide, the latter substance precipitating from a deficiency of acid. But I am satisfied that if much or prolonged heat is employed in dissolving the iron, the precipitate will not be a pure sesquioxide, but will contain an appreciable quantity of the substance obtained from the glass of the vessel used in the process. I feel sure that this peculiar substance exerts a notable influence in the formation of the well known precipitate, if it is not in reality the *cause* of it, as may be shown in one process of obtaining the crystals from the tincture of iron. To prove whether or not they were derived from the glass of the vessel, I made a gallon tincture of iron by the old U. S. P. process, adding to the subcarbonate of iron about three-fourths of an ounce of very finely pulverized glass, before introducing the muriatic acid. But to be plainer, I give it in the form of a recipe:

Take of Subcarbonate of Iron,	12 troyounces.
White Glass, in very fine powder,	6 drachms.
Muriatic Acid (commercial),	2½ pints.
Alcohol,	6 pints.

Introduce the subcarbonate of iron and glass into a flask, or any suitable vessel, and add the muriatic acid. After effervescence has subsided (or nearly so), place the vessel over a fire and boil gently until the liquid begins to be but slightly muddy-looking, or until the sesquioxide seems nearly dissolved. (It will not be clear.) Have the alcohol warmed, but not boiling, and mix both the liquids together well. Filter immediately through *white* filtering paper (made stronger than usual). Set the clear tincture aside for three or four days, that crystallization may take place. At the end of this time a quantity of small granular crystals will be found on the bottom and sides of the

bottle containing the tincture. Just at this point two modes of procedure may be adopted. First, the tincture may be decanted *clear* from the crystals, which may be then redissolved in a small amount of boiling muriatic acid, diluted with an equal measure of alcohol, filtered rapidly while hot, and set aside for crystallization; or secondly, the tincture may be heated by a water-bath to boiling, *without removing the granular crystals*. In this case a copious yellowish-brown precipitate will take place, identical in appearance with the well known precipitate from tincture of iron as made from the subcarbonate. This precipitate may be collected and dissolved in boiling muriatic acid and alcohol as in the first manner, and set aside to cool and crystallize. Three or four ounces of the acid and alcohol will probably dissolve the greater part of the precipitate, but if much has formed it will take proportionally more. After crystallization has taken place they must be collected on a filter of white paper, and washed with a little diluted alcohol and rinsed with distilled water, when they may be dried in any convenient way.

The crystals may be made by the above recipe, omitting the subcarbonate of iron and acting on the glass alone, and proceeding exactly in the same way.

Having detailed the process of obtaining the above substance, a few remarks upon its properties will not be amiss.

There seem to be at least three modifications of it, or perhaps three different combinations of it with other substances.

First. The *granular* state,—the result of its primary crystallization from the fresh hot tincture after several days. (They begin to form as soon as the tincture cools.)

Second. The yellowish-brown precipitate obtained by boiling the tincture in contact with the first or granular crystals. This seems to be the same precipitate so often noticed in the tincture of iron. The action of the heat, and perhaps etherification, appears to accomplish in a few minutes what ordinarily takes weeks and months to do the same.

Third. The white, silky crystals, the most remarkable of all its forms, and about which the whole of this has been written. These crystals may be heated to dull redness, with but little change. .

If placed in contact with the blue portion of any ordinary gas-jet, they will first shrink to about one-third of their bulk, from apparent fusion of the silky fibre. After a short time they begin to glow with dazzling brightness. A small cluster of the crystals should be stuck on the point of a common steel pen, and held *against*, but not *inside of*, the blue flame.

If decomposed by a boiling solution of potassa a precipitation occurs, and if muriatic (or perhaps any strong) acid is added, solution will be effected. Strong alkaline solutions will again precipitate, and acids dissolve, alternately for a great number of times.

Oxalic acid precipitates the solution last spoken of.

The color produced in a blue flame is reddish.

The crystals are sparingly soluble in cold water or dilute acids, quite soluble in strong hot muriatic acid. Tasteless before burning, but alkaline after having been in a strong heat.

In composition it is probably a silicate of lime (is it?).

Nashville, Tenn., Jan. 28, 1870.

OUR NEXT PHARMACOPŒIA.

BY HIRAM VAN SWERINGEN, FORT WAYNE, IND.

Our Pharmacopœias and Dispensatories have, as a general thing, cautiously kept pace with the scientific progress of the age; and in tracing them from their origin to the present time, while it is gratifying to observe the gradual influence of knowledge in reducing the number of their articles,—simplifying the composition of their formula,—and improving the processes for their preparation, it seems necessary that considerable precaution should be exercised in reference to the *rapidity* with which such reduction is being made, a consideration of the position, merits and demerits, of those articles to be expelled and the reasons for their expulsion.

In Dr. E. R. Squibb's report as chairman of the committee upon the revision of our national Pharmacopœia, which was read in Chicago at the last meeting of the American Pharmaceutical Association, it appeared to me, that he made a furious attack at, and picked to pieces our present standard of medicinal prepara-

tions, upon no other reason than that many of them conflicted apparently with the progress of the science of chemistry to which, if I mistake not, he is mostly attached.

While it is very evident that chemistry has been the means of establishing the identity of many bodies which were long considered different, causing an extensive list of animal substances to be discarded from former Pharmacopœias upon the ground that they owe their properties to one and the same principle, as to gelatine, albumen, carbonate of lime, &c., &c., and that the fixed alkaline salt produced by the incineration of different vegetables has been found to be potash, from whatever plant it may have been obtained, with the exception of a few which yield soda and ammonia.

But from the very nature and object of a Pharmacopœia, it cannot be supposed to proceed *pari passu* with the march of chemical science; indeed it would be dangerous that it should, for a chemical theory should be examined by the light of experience before it should become current. A Pharmacopœia, however, is always an object of abuse because it is a national work of authority, and its title to respect and claim to utility is daily questioned among the pharmaceutical and medical fraternities. Prominent, undoubtedly, among other objects in the report of Dr. Squibb—who by the way is one of the wheel-horses—if I may be allowed the expression—of chemistry and pharmacy in this country, by whose invaluable assistance those sciences have so far progressed, and society has been so much benefitted—was the provoking among the members of the association an *honest, high-toned and scientific, general* discussion, whereby *truth* might be elicited, and science advanced.

Experience has fully established the value of many medicinal combinations, which at the time of their adoption could not receive the sanction of any chemical law. By referring to our present Pharmacopœia, Prof. Parrish's Pharmacy and other standard pharmaceutical and medical works of this country, we will observe combinations of this nature in which the chemical decompositions which would naturally constitute an objection to their use, are in fact the causes of their utility, a fact which has thrown considerable light upon the theory of medicinal combinations.

We never profit more than by those unexpected results of experiments which contradict our analogies and preconceived theories. Whenever a preparation is found by experience to be *effectual*, should the practitioner listen with extreme attention to any *chemical* advice for its correction or improvement? From a mistaken notion of this kind the “*extractum colocynthidis compositum*” was at one period in its history, with a view of rendering it chemically compatible with calomel, deprived of its soap, which previously had entered into its composition, and in consequence of which its solubility in the stomach was so materially modified, its activity impaired, and its mildness diminished, that it was found necessary to reinstate it. Substances may be *medically* inconsistent, which are *chemically* compatible. The stomach has a chemical code of its own, by which the usual affinities of bodies are frequently modified, often suspended, and sometimes entirely subverted. It has been found that copper swallowed in its metallic state was not rendered poisonous by meeting with oils, or fatty bodies, nor even with vinegar in the digestive organs. Other bodies, on the contrary, seem to sustain the same relations to each other in the stomach as in the laboratory, and are alike influenced in both situations by the chemical action of various bodies, many examples of which are to be found under the consideration of the influence which solubility exerts upon the medicinal activity of substances.

Acidity in the stomach is neutralized by alkalies, and if a carbonate be employed, we have a copious disengagement of carbonic acid gas, which is frequently very distressing to the patient. Many bodies taken into the stomach undergo changes and decompositions in *transitu*, independent of any play of chemical affinities, from the hidden powers of digestion.

As *Pharmacists*, then, should we not protest against the prevailing custom among those who are devoting most of their time and attention to chemistry and the manufactures dependent upon that science, of examining and deciding upon the pretensions of every medicinal compound in which we have long had the utmost confidence, simply by a mere *chemical* investigation of its composition? and of rejecting as fallacious every medical testimony which may appear contradictory to the results of the laboratory?

What kind of an appearance would the Dispensatory of 1870 present, if the expulsion of so many preparations as is advocated by Dr. Squibb were consummated? What innumerable disadvantages the pharmacist and physician would be subjected to in consequence. What an immense field would open out to the gaze of the empiric. What a traffic in non-official preparations would be instituted, resulting in the most fearful incongruities,—thereby defeating the grand objects and use of a national pharmacopœia. I do not wish to be understood as advocating the generally conceived opinion that a pharmacist cannot err if he implicitly obeys the dogmas of his authority, (the Pharmacopœia,) for it partakes of our own natures and is consequently imperfect, and a *too strict adherence* to it would have a tendency to oppose the progress of reason, the advancement of natural truths and the prosecution of new discoveries. Our present Pharmacopœia, perhaps, would have been more perfect had it not been that, to give general currency to a hypothetical opinion, or to a medical reputation of an inert substance, requires only the talismanic aid of a few great names, and when once established upon such a basis, ingenuity, argument, and even experiment, may open their ineffectual batteries. It is an instinct in our nature to follow the track pointed out by a few leaders; we are gregarious animals, in a moral as well as a physical sense, and we are addicted to routine, because it is always easier to follow the opinions of others than to reason and judge for ourselves. The laconic sentiment of the Roman satirist is ever opposed to our remonstrance:

“Did Marcus say it was a fact? then fact it is;
No proof so valid as a word of his.”

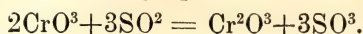
In conclusion, my fellow pharmacists, let us be actuated by studious reflection rather than by established habits.

ON THE PREPARATION AND MEDICINAL USE OF HYDRATED SESQUIOXIDE OF CHROMIUM.

BY C. J. RADEMAKER, M.D.

Having had frequent occasion to prepare this oxide of chromium, the following process was resorted to: Bichromate of potash was decomposed in the usual way by SO^3HO , the CrO^3

separated, and reduced by means of SO^2 . The reduction may be explained by the following equation :



The sulphuric acid formed combining with the oxide of chromium to one equivalent of sulphate of chrome. The sulphate of chrome was decomposed by ammonia; the chromic oxide was washed with boiling water and dried.

This preparation has been used with great success in this city by Dr. Wilson and others, in the treatment of cholera infantum and other complaints of the alimentary canal.

Dr. F. C. Wilson, of New York, first informed me of its beneficial effects in these complaints, and at his suggestion the preparation was made. Its mode of action I am not able to give, but it is probably that of an astringent and tonic.

Louisville, Ky., Jan. 9, 1870.

REMARKS ON COLLODION AND CANTHARIDAL COLLODION.

BY WILLIAM SILVER THOMPSON.

The unrecorded experience of many pharmacists who have prepared collodion and collodion cotton has probably been like my own, an alternation of successes and failures; and without attempting a review of what has heretofore been written on the subject, I offer the following remarks and formulas; not laying much claim to originality, except in some points considered essential to successful results in conducting the processes :

For preparing collodion cotton I prefer a mixture of nitric and sulphuric acids of the officinal sp. gr. to the sulphuric acid and nitrate of potassa mixture of the Pharmacopœia of 1860, as being less troublesome, less expensive and affording a better result. The most important point to be observed in the acid mixture process is to have the nitric acid of the officinal sp. gr. The sp. gr. of the sulphuric acid is not of so much importance; an acid somewhat stronger than the officinal may be used, but in no case of a less sp. gr. When the acids are mixed in a suitable glass vessel it should be covered with a plate of glass and placed in a vessel of cold water until the temperature of the acid mix-

ture is reduced to 70° or 80° Fahr., when the cotton may be immersed and allowed to remain from one to twelve hours, or even longer. At the temperature of 110° Fahr. a good cotton may be made in one hour, but above that temperature much waste and sometimes damage to the cotton ensues.

A cause of failure in preparing collodion cotton is probably in using too large a quantity of cotton to the amount of acid mixture used. Sixty grains of cotton cannot be properly immersed in two fluid-ounces, but I have succeeded in every instance when only thirty grains were used. After the cotton is immersed in the acid mixture there should be a sufficient excess to allow it to flow freely over and through the fibres, so as to insure contact with every particle. When the larger quantity of cotton is used it is almost impossible to immerse it properly, hence there is always a portion not thoroughly acted on by the acid, and which is necessarily to the same extent insoluble.

Washing the cotton is another important part of the process. When the quantity operated upon is small this may be accomplished without difficulty, by simply throwing the whole into a large bulk of water and keeping the temperature down by agitation with a glass rod; but with larger quantities it is necessary to proceed more cautiously, to avoid a great and sudden elevation of temperature, to the waste and damage of the cotton. A good plan is to take up a small quantity at a time on the end of a glass rod and immerse it in cold water, keeping it in motion until a large portion of the acid is removed, and so on until the whole is cooled. It may then be washed in the usual manner to free it entirely from acid.

Collodion cotton prepared as above retains its toughness of fibre, and is readily and entirely soluble in equal measures of stronger ether and stronger alcohol, with the exception of a minute amount of flocculent substance, which is deposited on standing. When the cotton is prepared with the acid mixture at a temperature considerable above 110° Fahr. the fibre is short and weak, and the cotton will be found to have increased but little or none in weight, owing to its solubility in the acid at an elevated temperature. This cotton, which is also very soluble, is said to be preferred by photographers, but is not so good for

pharmaceutical purposes as that prepared at a lower temperature.

Collodion Cotton.

Take of nitric acid, sp. gr. 1.42, one fluid-ounce ;

Sulphuric acid, sp. gr. 1.84, one fluid-ounce ;

Cotton freed from impurities, thirty grains.

Mix the acids in a beaker glass or other convenient vessel ; cover with a plate of glass and place it in a vessel of cold water until the temperature is reduced to 70° or 80° Fahr., when remove the glass from the water and immerse the cotton. At the expiration of twelve hours wash the cotton with cold water until free from acid, and dry it at a moderate temperature.

Collodion.

Take of Collodion cotton, six grains or a sufficient quantity ;

Stronger ether, one fluid-ounce ;

Stronger alcohol, one fluid-ounce.

Mix the ether and alcohol in a three ounce vial and add the collodion cotton. Agitate the mixture occasionally until the cotton is dissolved.

Collodion paper has been introduced into use by photographers. This may be prepared in the same manner as collodion cotton, by immersing strips of pure, thin, unsized paper. It is more easily washed than cotton and makes a very pure and transparent collodion, using the same menstruum for its solution as for collodion cotton. If a sufficiently pure paper can be obtained at a moderate price, I think it will entirely supercede the use of cotton. Chemically pure filtering paper answers the purpose admirably, while tissue paper does tolerably well but is not so good. I have not succeeded so well with white printing paper, owing probably to its thickness.

Cantharidal Collodion.

Take of Cantharides, in fine powder, a troyounce ;

Collodion cotton, a sufficient quantity ;

Stronger alcohol, a sufficient quantity ;

Stronger ether, a sufficient quantity.

Moisten the cantharides with four fluid-drachms of stronger alcohol and pack it in a glass percolator of proper size, arranged

for displacement, with the lower end closed with a cork. Pour on the contents of the displacer four fluid-drachms of stronger ether and cover it with an accurately fitting plate of glass. At the expiration of twelve hours displace with a mixture of stronger ether and stronger alcohol in equal measures until two fluid-ounces are obtained, which set aside in a three ounce vial. Continue the displacements until one fluid-ounce more has passed through. Allow this to evaporate spontaneously and dissolve it in the first two fluid-ounces of percolate obtained, to which add six grains of collodion cotton, or a sufficient quantity to make the cantharidal collodion of the proper consistence. Agitate the mixture occasionally until the cotton is dissolved.

Baltimore, Md., February, 1870.

ON CAMPBELL'S PROCESS FOR THE MANUFACTURE OF FLUID EXTRACTS.

BY HENRY C. ARCHIBALD.

Esteemed Editor—Feeling, as I do, a lively interest in all that pertains to the advancement of Pharmacy, and having read with interest Mr. Campbell's process for the manufacture of fluid extracts, together with comments thereon, I determined myself to apply his theory of percolation (which, by the way, is an old one) upon a few drugs, and to submit for inspection my views of the same. We all know that what is most wanted in a fluid extract is that the active constituents of the drug be fully and wholly represented, without, or at least, with as little decomposable matter as possible, at the same time to have a menstruum of uniform strength, capable of holding, without precipitation, the active matter so taken up. These qualities, with but few exceptions, are attainable by the processes of the U. S. P., which afford most excellent products. In order to determine whether Campbell's process possessed that merit, which the author claimed, a few experiments were made, with the following results :

1st. 16 troyounces of Jamaica ginger of the requisite fineness to pass through a No. 40 sieve, were moistened with f $\frac{3}{4}$ of a menstruum, composed of alcohol three-fourths and glycerin one-

fourth, the whole thoroughly incorporated and transferred to a conical percolator, covered with a disk of filtering paper, upon which the remaining $\text{f}\overline{3}12$ of menstruum were poured. When the percolate had penetrated the sponge, placed in the neck, a cork was inserted, and the whole was allowed to stand four days; after which, the cork being removed, the percolate was allowed to drop into a receiving vessel. Finding that all the menstruum had been absorbed, $\text{f}\overline{3}16$ of alcohol were added, and $\text{f}\overline{3}15$ of extract were obtained as the result. Pouring on another $\text{f}\overline{3}$, the preparation was brought up to its requisite volume. The $\text{f}\overline{3}16$ thus obtained were set aside, and percolation continued with alcohol, until $\text{f}\overline{3}16$ of exhausted liquor had passed, which were allowed to evaporate spontaneously. The residue consisted of resin and glycerin, the amount of resin present being 80 grains, or one and one-twenty-fourth p. ct. of the weight of the drug employed.

2d. Wild cherry bark, of requisite fineness, was carefully percolated with a menstruum, consisting of equal parts of glycerin and water. The result was an intensely dark extract, possessing the characteristics and odor of the bark in a marked degree. After obtaining the fluid extract, percolation was resumed with water, to find the amount of undissolved extractive matter, which was six p. ct. The exhaust obtained by continued percolation with water was highly colored and possessed a marked odor of the drug, showing evidently that the bark was not fully exhausted. The process for the manufacture of this fluid extract is extremely simple, the only doubt arising in my mind is whether the glycerin is capable of arresting fermentation, to which aqueous preparations of this drug are so liable.

3d. 16 troyounces of select rhubarb were reduced to a sufficiently fine powder to pass through a No. 40 sieve, moistened with $\text{f}\overline{3}6$ of a menstruum composed of glycerin one-fourth, water one-fourth and alcohol one-half, and treated in the same way as in the fluid extract of ginger. It required 24 additional fluid-ounces of dilute alcohol to displace $\text{f}\overline{3}16$ of the extract, which were set aside, and percolation resumed with dilute alcohol until the drug was thoroughly exhausted. The alcohol was recovered by distillation, the residue transferred to a water bath and al-

lowed to evaporate to the consistence of honey. Upon examination it proved to contain a large amount of glycerin, together with a very large proportion of extractive matter. The whole, when concentrated as far as possible with the means at my disposal, weighed no less than $5\frac{1}{2}$ troyounces. Allowing one-half to be glycerin it would leave $2\frac{3}{4}$ troyounces of extract not dissolved by the first 16 fluid-ounces of menstruum.

In order to demonstrate whether the exhaust contained any virtues, I first took of the extract, after concentration, fʒ 1; effect, gentle laxative. Next day I repeated the dose and increased it at the same time to fʒ 3; result, decidedly cathartic.*

In order to demonstrate that the above experiment was correct, I made another displacement of rhubarb. The results were so nearly identical that it confirmed me as to the impracticability of the process.

Similar experiments were made with valerian and cinchona rub., both of which have proven that, no matter how long the maceration, or how slow the displacement, it is impossible to fully obtain all the active matter of a drug in 16 fʒ of percolate.

Although admitting that when the percolation is properly conducted, and the nature of the drug well understood by the parties manipulating, a fluid extract can be obtained, which will very nearly represent the full activity of the drug, without subjecting it to the injurious effects of heat during evaporation; still the product is not what it is represented to be, and is not of the strength directed in the U. S. P. Again, the difficulty and amount of care required to properly conduct the process is so great, that, by incompetent hands, and often even by those who are well versed in the system of percolation, very variable and inferior preparations must evidently be the result.

It is apparent that, in order to make Campbell's process practicable, a total revision of the Pharmacopœia, relating to the subject of fluid extracts, would be necessary; if a fluidounce of the extract were made to represent a half ounce of the drug, there is no doubt but that this system would become very useful

* QUERY.—Would not a menstruum composed of three-fourths alcohol and one-fourth glycerin dissolve more of the active constituents of the drug?

and popular, as then the whole of the active matter could be fully extracted without difficulty.

There still arises the question, whether glycerin is capable of arresting fermentation in all preparations wherein it takes the place of sugar. It is well known that it possesses great preservative powers, but whether it would meet every emergency, time alone can determine. The writer does not think it necessary to further enlarge upon the matter, but leaves it to the careful consideration of all who feel interested sufficiently to fully investigate the subject.

Philadelphia, Feb., 1870.

THE WEEDS OF WESTERN PEPPERMINT PLANTATIONS.

BY JOHN M. MAISCH.

On pages 449 to 459 of the Proceedings of the American Pharmaceutical Association for the year 1858, there is printed a very valuable paper by Frederick Stearns, which is entitled "The Peppermint Plantations of Michigan," was copied at that time into many American and European periodicals, and is now frequently referred to in standard works on materia medica. It is stated in this paper that the weed which appears in the mint plantations is *Erechthites hieracifolia*, known by the common names of horse-tail, cow's-tail, mare's-tail, field-broom, bitter-weed and fireweed. Mr. Stearns states, after Asa Gray, that *Erechthites* grows in moist woods and *recent clearings*, but does not explain the contradicting fact that the same plant should appear in peppermint plantations *during the second year, and increase from year to year*. The habit of *Erechthites*, as I have noticed it near Philadelphia, is correctly stated in botanical works; it appears in new clearings, particularly where the ground has been burned over, but it disappears from cultivated open fields. Notwithstanding this irreconcilableness, there was no apparent reason for doubting the correctness of Mr. Stearns' statement, since the plant is very easily recognized and the facts are stated with positiveness.

In October last Messrs. Powers & Weightman referred to me a letter from Mr. C. A. Ensign, of Centreville, Mich., together

with two plants, which proved to be *Erigeron canadense*, Lin., and *Erechthites hieracifolia*, Raf., and were named correctly by Mr. Ensign, who, to use his own words, is not acquainted with botany; he further observed in his letter: "Peppermint grown on *new grounds*, or those just cleared, is quite likely to be mixed with true fireweed (*Erechthites*); but the colt's-tail (*Erigeron*), *commonly known among farmers here as fireweed** also, is *far more prevalent in our mint fields*, and almost always is the cause of what is called 'weedy oil,' though sometimes it may contain *Erechthites*, and in a few instances the distillation of rag-weed (Roman wormwood)."†

The druggists in Mr. E.'s neighborhood stated that he was wrong in naming the plants as he did; they relied on the U. S. Dispensatory, the statements of which are based upon Mr. Stearns' paper, who probably never saw the weed growing among peppermint, and merely named it after Gray, whose botany contains the ordinary names most widely known. Mr. Stearns' mistake led to the other errors; but it is to be regretted that there are apothecaries who do not feel sufficient interest in medicinal botany as to be able to tell *Erechthites* from a species of *Erigeron*.

Feeling interested in the subject, I corresponded with Mr. Ensign, who lives in the mint region and raises peppermint; he very kindly answered several of my queries, and since he is evidently a careful and shrewd observer, it will be best to give such portions of his letter, dated Nov. 4th, 1869, as may seem to be of particular interest, and may serve to correct the errors of others.

"The *Erigeron*," he writes, "is known in northern Ohio and this vicinity as horse-tail, mare's-tail, colt's-tail and cow's-tail, besides having acquired the name of *fireweed* in this locality. It not only grows among mint, but springs up in the wheat stubble and pastures. In the latter it grows more plentiful the first year after the grain crop is taken from the land, and where the seedling is light. I have noticed it growing plentifully this year in an old sod pasture.

* My italics; the following is underlined in Mr. Ensign's letter. J. M. M.

† *Ambrosia artemisiifolia*, Lin.

"You have named the usual course of the weed in our mint fields,* except that the fourth year plowing, to continue the mint and kill the weed, is not now practiced here.

"The 'June grass' (a veritable grass, but I have no means just now of giving you the botanical name), as also stated, *sometimes* grows in mint, but I think this grass yields very little distilled matter. I cut a field of third year mint this season that had grown largely to both red and white clover, but I think the clovers yielded very little, if any, to the distillation. On the other hand, *Erigeron* yields about twice what the same bulk of mint usually does (or did so for me this year, which has not been so favorable for large yield of mint according to bulk, though the season has been favorable for a large growth). The growth of the clovers and grass in the mint may be said to be *occasional*. Besides these, I have seen horse-sorrel† attaining a thrifty growth with mint, and I have seen ragweed (Roman wormwood) growing in it, and one field was grown over with young shoots of sassafras (which last must produce a good deal of adulteration in the oil); but these may be said to be *seldom*.

"*Erechthites* is to be found in mint fields, but *only* on *new lands* or those *never before cropped*; and in such fields it is to be found in the first year's mint, about stumps, rough places, and in patches where brush, &c., were burned in clearing. I presume *Erechthites* grows some the second and following years also, but *have not noticed*.‡ It might be supposed that the tilling would keep these down the first year, as *Erigeron* is kept down the first year in old lands; but it is to be understood that farmers favor new lands in the openings for mint, as they need but comparatively little tillage for it, *Erechthites* being the principal weed to grow (and that where wood has been burnt). But the harvesting of the first crop of mint being unlike that of the following crops, better opportunity to reject the *Erechthites* is

* After Mr. Stearns' paper quoted above.—M.

† Query: *Oxalis stricta* or *Rumex acetosella*?—M.

‡ This observation is undoubtedly correct, since *Erechthites* does not inhabit cultivated or open fields; its occurrence in mint fields during the second year must be very rare, and it probably never grows in these fields afterwards, unless in close proximity to partly burned stumps.—M.

given, so I am inclined to think few crops are much affected with this weed, *Erigeron* being the chief cause of adulteration; by 'weedy oil' is commonly meant that containing *Erigeron* (that is, in this vicinity).

"Oils are often colored by rust from the boilers and pipes, and by causes I am unable to give as yet; perhaps too much heat, or by reason of the mint being cut too green or young. Formerly, when copper stills were used, the oil was milky in appearance, and was then all filtered (through paper). Most of the oil is sent away (generally to New York) after one distillation, but occasionally a bad looking lot is re-distilled, or filtered through animal charcoal and sand, the filtering said to waste less and take away all color. I do not hear of any further process of rectifying mint oil."

The information contained in this letter is of great interest, and if Mr. Ensign carries out his intention of sending me samples of the various oils, it is not improbable that some chemical tests may be observed, which may be of value for detecting the usual impurities.

The point which has been undisputably settled is that *Erigeron canadense* is the pest of the western mint fields, and the admixture of the oil of peppermint with the oil of this weed I believe is calculated to explain several circumstances. Our American oil of peppermint is exported to Europe in considerable quantities, but both in Europe and this country it does not command the price of European oil, the latter being usually rectified, and much superior in odor to our more rank American oil. Careful distillation of well selected fresh herb, and subsequent careful rectification, may remedy this defect.

Pure rectified oil of peppermint, when exposed to the air, thickens very slowly, while some of our commercial oil in a comparatively short time acquires the consistence of sweet oil, and is even turned into a thicker oleoresinous liquid. This is probably due to the presence of oil of *Erigeron*; the latter at least, when kept in partly filled vials, which are occasionally opened, soon becomes thick, and finally forms a transparent varnish.

Commercial oil of *erigeron* is but little acted upon by powdered

iodine; its behaviour is similar to that of oil of peppermint, and the admixture cannot therefore be detected by iodine. A reliable test for the presence of this adulteration is requisite; when discovered, the mint growers will probably find it to pay better to prepare pure oils of erigeron and of peppermint, and the latter properly rectified will then undoubtedly come nearer to the finer European oils, and yield a better profit to the maker. On the other hand, there is no good reason why oil of erigeron should not be much lower in price than it is at present, if it should come into more extended use as a medicinal agent, the plant not requiring cultivation and yielding fully as much oil as peppermint.

It may be mentioned incidentally, that *Erigeron Canadense* is one of those North American weeds which has spread over a considerable part of the civilized world.

ASSAY OF A PURE AMERICAN OPIUM,

From Poppies grown at Hancock, Vermont, by Mr. C. M. Robbins.

BY WILLIAM PROCTER, JR.

On the 18th of January the writer received a sample of about an ounce of opium from Messrs. Rosengarten & Sons, with the information (in the form of a copy of a letter from Messrs. Howe & French, of Boston, Mass.) that it was received from Mr. C. M. Robbins, of Hancock, Vermont, who raised the poppies producing it from foreign seed, which had cost *ten dollars* per ounce. The opium was obtained by scarifying the capsules in the manner it is done abroad, and the exuded juice collected and dried in the sun, when it turns dark colored. No leaves, or capsules or other foreign substance is admixed, but its consistence is that of an extract rather soft than firm, but the softness does not appear to be due so much to moisture as to its caoutchoucoid character, as after long drying it lost but five per cent. of its weight, and broke with a short, shining fracture when quite cold. The entire crop of this experiment was 11 ounces, and in its odor and taste closely resembles good Turkey opium. In a letter from Mr. Robbins, since shown to me by Messrs Rosengarten & Sons, he says, "I planted about 15 square rods of land [about one-tenth of an acre] in poppies, rows two feet

apart, hills one foot apart. It was in growth from June 1st to October 1st. The heads were punctured only once a day, in the afternoon; we cut several small gashes in the sides, being careful not to cut through the inside. The opium was scraped off the next morning and dried on plates in the sun. In my opinion we did not get over half the opium that might have been obtained. The poppy seed was not planted early enough by two or three weeks. The poppy grows well and seems hearty, and requires dry soil."

One hundred grains of this opium was rubbed with water in a mortar until the whole was emulsified. After standing several hours with occasional agitation it was thrown on a tared filter, and after draining, the dregs were well washed with water, dried, and weighed 33 grains. The liquid thus obtained was carefully evaporated, at a moderate heat, to six fluidrachms, mixed with its bulk of alcohol and filtered; 30 grains of aqua ammoniæ, sp. gr. 960, mixed with three times its bulk of alcohol was slowly added with constant stirring until a decided excess was obtained, well stirred, and allowed to stand 24 hours. The ammonia caused an immediate granular precipitate, which increased on standing. At the end of the period mentioned, it was collected on a tared filter, thoroughly washed with cold water and dried. The precipitate was of a uniform light drab color, and weighed 18.2 grains. It was now boiled in repeated portions of ether, washed on a filter with that liquid and then dried, when it weighed 16.25 grs. This substance has the properties of morphia, being reddened by nitric acid, blued by sesquichloride of iron, but is colored. It was therefore dissolved in repeated portions of boiling alcohol, the solution filtered and evaporated and crystallized. The filter was well washed, and, on drying, the brown matter weighed 0.5 gr., making the yield of crystallized morphia 15.75 grs.

The ethereal washings of the morphia precipitate yielded nearly 2 grains of crystalline matter, which formed a clear yellow solution with nitric acid, consisting chiefly of narcotina, with a little brownish amorphous matter around the edge of the dish.

The liquid from which the morphia precipitated was found to

yield a deep red coloration with sesquichloride of iron, and was treated with a slight excess of chloride of calcium, the gelatinous precipitate collected on a filter, washed, suspended in a fluid-ounce of water at 190° F., an excess of dilute hydrochloric acid added, filtered hot, and allowed to stand some hours. The crystalline granular precipitate of bi-meconate of lime was collected and treated with hot diluted hydrochloric acid, when the meconic acid in colored crystals, separated on standing, was washed and dried.

The original undissolved residue of the opium, weighing 33 grains, was now treated with coal oil benzine, nearly pure, until exhausted, and the dark liquid evaporated until all the benzine was removed. A soft elastic residue of caoutchouc was obtained, weighing 11 grains. This probably contained some narcotina and other principles as resin and fixed oil, but it was not further treated—the chief object of its extraction being to show by its quantity a sufficient cause for the softness of the opium in the absence of the usual percentage of moisture.

The residue left by the benzine was incinerated in a platinum crucible, yielding 0.5 gr. of light fawn colored ash.

The result from 100 grains, therefore, is as follows :

Morphia,	15.75
Narcotina, impure,	2.00
Meconic acid,	5.25
Caoutchouc, fatty matter and resin,	11.00
Insoluble residue (including 0.5 of ash)	22.00
Matter soluble in water, other than salts of morphia and narcotina, as gum extractive, etc.,*	38.50
Water,	5.00

Messrs Rosengarten & Sons meanwhile made an examination of this opium for morphia, for their own satisfaction, and obtained about 15 per cent., which corroborates this result for that ingredient, the discrepancy in amount being due to more careful manipulation in this assay.

No examination was made of the gum or extractive ingredients. On the whole it may be inferred that the opium obtained

* No attempt was made to isolate either codeia, narceia, meconin or other well defined principles of opium existing in small quantities.

by Mr. Robbins is pure and of extraordinary strength, indicating it to be the inspissated juice of the capsule of the poppy, unmixed with either organic or inorganic adulteration, and it is to be hoped that the producer will, in the coming season, give his earnest attention to another and more extended experiment, particularly in relation to the extraction of the juice so as to avoid loss. The quantity of soil under culture in this instance was about one-tenth of an acre, and the product was worth at the market rate per single pound ($\$14. \div \frac{1}{16} = \9.62) worth nearly \$10 or about \$100 per acre. If, as Mr. Robbins says, he obtained only half of the juice, this result may be doubled. Too much stress cannot be laid on the importance of keeping the product unmixed with impurities, and especially extractive matter as an adulteration, as in Mr. Wilson's so-called opium, which is almost wholly an extract of the leaves of poppies.

ON THE SYRUP OF IPECACUANHA.

By J. B. MOORE

In the last revised edition of the U. S. Pharmacopœia (1860) two of the officinal syrups are directed to be made by simply mixing the fluid extracts of their respective drugs, in proper proportion, with simple syrup, a departure from the usual mode of operating which I think is open to very serious objection, in view of the great uncertainty of the strength and quality of fluid extracts, as it is well known to the pharmaceutical profession at large that fluid extracts are the most unreliable of all Galenical preparations. If all apothecaries were adepts in percolation, and were qualified by much practice to manufacture fluid extracts for themselves, this would in some measure justify the action of the committee of revision. And if they were so qualified, how few would take the trouble to do so when they can buy them so cheaply, or else why is it that so many large wholesale manufacturers of this class of pharmaceutical preparations can find a market for their products.

We all know that it is a very convenient and expeditious way of making a syrup, to prepare it from a fluid extract; but I hold that the uniform quality and standard strength of any medicinal

agent should not be sacrificed nor placed in jeopardy for the sake of convenience or the saving of a little trouble and labor, and especially not in a preparation so important as that of syr. of ipecac. This method, therefore, should never have been sanctioned by so high an authority as that of the U. S. Pharmacopœia. I deprecate it, not only on account of its liability to afford inefficient and unreliable preparations in the instances referred to, but also because of the evil consequences that are likely to ensue from the example. It is establishing a precedent which is apt to engender and encourage a laxity of practice in the manufacture of other pharmaceutical preparations, which would be highly prejudicial to the best interests of medicine and pharmacy. Apothecaries may feel justified thereby, and I think with much propriety, in following the same short method in making other similar preparations. Now if this practice is generally adopted, and I know that it is followed by many apothecaries, it will offer to the medical profession a sorry set of medicinal agents with which to combat disease.

Unfortunately the fluid extracts from which the two official syrups named above are ordered to be prepared are among the most difficult and unsatisfactory to make. Complaints of the fld. ext. ipecac. are almost universal, and there are but few who can make it in a satisfactory manner for making the syrup, owing to the difficulty of completely separating the resinous matter, which causes an unsightly precipitate when added to simple syrup and mars its beauty and transparency.

I am well aware that the old formula for syr. ipecac., U. S. P. 1850, was very unsatisfactory, on account of the tendency of the syrup as made by it to fermentation, but I think that it has been supplanted by one still more objectionable. These remarks will also apply to the formula for syrup of rhubarb, and I hope to see these two formulas expunged from the next revised edition of that authoritative work, U. S. P., and in their stead good practicable and easily-worked formulas substituted, by which any pharmacist of ordinary intelligence may be enabled to make their preparations in a correct and reliable manner, directly from their respective drugs, and not by means of uncertain fluid extracts.

Owing to the great instability of many of the officinal syrups, much difficulty and annoyance have been experienced by pharmacists in their preservation, for a long period in warm weather. No matter how carefully prepared, certain of these syrups are liable to spoil if long kept, and in consequence of this tendency, apothecaries are obliged to make them in small quantities at a time, in order to avoid loss.

Various means have been proposed for the preservation of syrups, and many expedients have been resorted to, but none seem to have effectually accomplished the object. Many of the agents recommended for this purpose are both pharmaceutically and medicinally objectionable. Some adopt the plan of putting the syrup, while hot, into bottles, corking tightly and keeping them in a cool place; but this is troublesome and but few will do it, and even after this precaution has been observed, the syrup, when opened and transferred to the shop bottle, is still liable to spoil, unless used in a short time.

With the view of conquering this difficulty in some of the more important officinal syrups, such as those of ipecac. and rhu-barb, mentioned above, and senega, scilla comp., wild cherry, &c., the writer has been engaged for the last year in a series of experiments for the purpose of devising a set of formulas for these syrups, by which they may be made not only more efficient and reliable, but also sure as to their stability.

The formula and process for the syrup of ipecac. I present below, and the result of my efforts with the others will be given in this Journal as soon as the process for each is *perfected* and *thoroughly tested*.

Take of Ipecacuanha in powder, No. 60, two troyounces.

Acetic acid,	sixty minims.
Glycerin,	eight fluidounces.
White sugar, in coarse powder,	eighteen troyounces.
Alcohol,	
Water,	

Diluted Alcohol, of each a sufficient quantity.

Moisten the ipecac. with alcohol, pack it firmly in a cylindrical glass percolator, then gradually pour upon it, first, two fluid oz. of alcohol; when this has been absorbed, pour on gradually eight

fluidounces of a mixture consisting of two parts of alcohol to one part of water, and when this has all passed from the surface, continue the percolation with diluted alcohol until ten fluidounces of tincture have been obtained, observing to set aside in a plate or shallow dish, in a warm place, the first two fluidounces which pass, that they may evaporate spontaneously to a syrupy consistence. Then mix the acetic acid with the remainder of the percolate and evaporate carefully in a water bath, with frequent stirring, until reduced to two fluidounces and a half; add to this the reserved portion, and mix the whole with ten fluidounces of water, and continue the evaporation until the mixture is reduced to twelve fluidounces, and when cool filter through paper, and pass sufficient water through the filter to make the filtered liquid measure twelve fluidounces. To this, in a bottle, add the sugar; shake occasionally, and when dissolved add the glycerin, and strain through muslin.

When there is need to finish the syrup quickly, the solution of the sugar may be hastened by placing the bottle in hot water and shaking frequently.

The above formula affords a clear, bright and beautiful syrup, free from cloudiness or precipitation which so frequently occurs when made from the fluid extract.

I have a sample of this syrup made in July last, which, although it has been kept in a warm place in my store-room, in a bottle but partially filled, and frequently opened, is nevertheless apparently as fresh and sweet now as the day it was prepared, and I feel confident that it will keep for an indefinite time, unaltered at any ordinary temperature.

In manufacturing it on a larger scale, the greater portion of the alcohol may be recovered by the use of the still.

In the above process I have employed acetic acid to fix the emetia during the concentration of the tincture, as suggested by Prof. Procter in fluid extract of ipecac.

Glycerin has proved to be, in the writer's experience, an excellent and efficient auxiliary to sugar as an antiseptic agent in the preservation of syrups, and its general character and properties are so in harmony with those of the latter that it is peculiarly qualified for the above purpose.

Good glycerin has now become so low in price, costing but from thirty-three to thirty-five cents per pound, that to make use of it in the preparation of syrups adds but a trifle to their expense.

Twenty-five per cent. of glycerin, with the proportion of sugar employed in the above formula, will keep almost any syrup.

In estimating the additional cost of making syrup with glycerin, as above directed, it must be borne in mind that the quantity of sugar required is thereby greatly reduced. In a quart of the above syrup, but eighteen instead of thirty troy-ounces of sugar are employed, consequently the glycerin adds but about ten cents to the cost of the whole product,—a matter too trivial to be taken into account when its advantages are considered.

As an addition to all the pectoral and expectorant syrups, glycerin is useful not only as an antiseptic, but also on account of its enhancing, in a measure, their medicinal virtues, and as a means of diminishing the amount of saccharine matter in them its advantages are obvious.

Philadelphia, February, 1870.

NOTE ON SULPHO-CARBOLIC ACID AND THE SULPHO-CARBOLATES.

BY THE EDITOR.

Sulpho-carbolic acid and its salts were among the derivatives of phenyl which the fertile mind of Laurent worked out of the products of coal tar as early as 1841, describing it under the name of sulpho-phenic acid. Only of late, however, since carbolic acid has had its therapeutic and antiseptic properties more fully developed, has the attention of medical men been attracted to this acid and its salts. Mr. C. H. Wood, F.C.S., in a paper published in the *Pharmaceutical Journal* for January, 1869, says that Dr. Sansom had shown to the Medical Society of London the sulpho-carbolates of potassium, sodium, and magnesium, and recommended them as antiseptics in cholera and zymotic diseases generally; and that Mr. John Wood, of Kings College Hospital, in the *Lancet* of Dec. 7th, 1868, states that sulpho-carbolate of zinc “is prescribed in aqueous solution of from 3 to 6 grs. to the ounce as an injection in the treatment of gonorrhœa, and also as a dressing for wounds and sores.”

In a recent letter from Dr. Frederick Hoffmann, of Sixth Avenue, New York, he says, in speaking of the sulpho-carbolate of zinc: "Recently it has been introduced into the hospitals of the Berlin Charité with such success that it has been adopted among the remedies of that famous institute. To all appearance, this salt, and perhaps other sulpho-phenates, may become a valuable and permanent addition to the *materia medica*.

"The zinc sulpho-phenate is said to combine the therapeutical virtues of both its constituents; its preference to phenol or to the phenates is said to depend on the gradual disengagement, and consequently upon the more continuous and uniform action of the phenol. The same may hold good with still greater promise for the internal use of this or other sulpho-phenates.

"I have prepared the sulpho-phenates of zinc and of sodium. The former has been tried, at my suggestion, by several physicians of New York, with entire satisfaction, in solutions of 3 to 5 grains per ounce, as a dressing to wounds and burns, as a gargle for the mouth or nose, and as an injection in gonorrhœa, etc."

In this city Dr. Freeman and others have used these salts to a considerable extent, and with decided success, especially in *ozœna*, and as it is therefore probable that they will get into general use, we have prepared the following notice:

Sulpho-carbolic acid is constituted like sulphovinic acid, though much more stable than the latter. According to Gmelin (*Handbook*, vol. xi, p. 157), its formula is $C_{12}H_6O_2, 2SO_3$, whilst Mr. C. H. Wood gives it as $(C_6^*H_5)H SO_4$. It is formed, according to Laurent, by mixing carbolic acid with an excess of sulphuric acid, letting the mixture stand twenty-four hours, and then, after dilution with water, saturating it with carbonate of baryta at the boiling temperature, filtering out the excess of carbonate and the sulphate formed, evaporating the filtrate to crystallization, the crystals recrystallized from alcohol and washed with a small quantity of alcohol, and finally decomposing its solution with an equivalent of SO_3, HO , and evaporating the filtrate in *vacuo*.

The acid in a free state, however, is not needed in purity, and the latter part of the process may be avoided. The baryta salt

is very convenient for obtaining the salts of other bases by double decomposition with their sulphates, the baryta being removed by the filter as sulphate.

According to E. Menzner (Chem. News, Jan. 3, 1868, p. 10), this acid is prepared by heating equal equivalents of carboic acid and sulphuric acid in a water bath, diluting, after standing twenty-four hours, with water, neutralizing with carbonate of lead, filtering and decomposing the plumbic sulpho-carbolate with hydrosulphuric acid, and carefully concentrating the filtered solution first by heat and afterwards in a dessicator.

For the purposes of the pharmacist, Mr. C. H. Wood recommends the direct saturation of the crude acid (formed by mixing two volumes of pure carboic acid with one volume of oil of vitriol in a glass flask, and heating the mixture to 290° F. for five minutes, allowing it to cool, and diluting with six or eight volumes of water) with the bases or their carbonates, and depending on crystallization to purify them. In this mixture there is a portion of uncombined sulphuric acid, which makes it necessary to purify all but the first crystallization by treatment with alcohol, to separate the insoluble sulphates. It appears to us that there is a loss sustained by this process, a portion of the carboic acid is also uncombined, and that after mixing the acids and heating them it is better to allow them to stand twenty-four hours before saturating. This is the plan we have adopted in making the soda, zinc, and magnesia salts. When the acids are mixed a reddish color is developed, which grows deeper by standing, and stains the salts a light rose color. Laurent notices this peculiarity. In adopting the baryta process this is avoided in great measure. Dr. Hoffmann prepared his salts from the baryta salt, which he made "by digesting in a water bath, at a temperature near the boiling point of water, a mixture of equal weight parts of crystallized and previously melted phenol (carboic acid) and sulphuric acid sp. gr. 1.84 during forty-eight hours, or until the mixture formed a clear solution with water. The acid mixture is then diluted with an equal bulk of water, and gradually added to freshly precipitated carbonate of baryta suspended in water until the carbonate is *nearly* all dissolved, when the solution of sulpho-phenate of baryta is ready for use."

Sulpho-carbolate of Soda.—Having had occasion to prepare this salt several times in quantities varying from a few ounces to more than a pound, we have used the following formula, which is very easily carried out, and may be found useful where this salt is needed to be made promptly, viz. :

Take of Pure Crystallized Carbolic Acid (Calvert's).

Sulphuric Acid (1.84 sp. gr.) 16 troyounces.

Distilled Water, three pints.

Crystallized Carbonate of Soda, a sufficient quantity.

Melt the carbolic acid in a bath of warm water and mix it with the sulphuric acid gradually added in a quart flask. Considerable heat is developed, which is increased by using direct heat until the temperature attains 280° Fahr. It is then allowed to stand, in a warm place, for 12 hours. Dissolve in the water, set aside a fluidounce of the solution and add the carbonate of soda, previously powdered, with constant stirring until saturation is approached, then proceed cautiously, to avoid an excess of alkali which deepens the rose color, using the reserved solution to insure its correction if, by accident, the solution is alkaline. (An advantage has been derived from using the bicarbonate of soda in the carbonate.)

The solution is now filtered, evaporated at 150° Fahr. to three pints, and set aside where it will cool slowly for 24 hours, to crystallize. The crystalline crusts should be broken up so as to drain in a glass funnel, and washed with a little ice cold water to remove the colored mother water, and then dried on bibulous paper, unless desired quite colorless, when it should be dissolved in hot water and again crystallized; but for all ordinary medical use the first crystallization, which amounts to about 22 ounces, is sufficiently pure, whilst the entire amount of the salts formed is more than 37 ounces. With the greatest care there appears to be free sulphuric acid, consequently sulphate formed, which is a great objection to the direct process for making the soda, zinc, and magnesia salts. Sulpho-carbolate of soda crystallizes in colorless rhombic prisms, and are permanent in the air, though containing water of crystallization. For this reason the mixed crystals of sulphate and sulpho-carbolate are easily distinguished on exposure, the former efflorescing. It is

soluble in five parts of water at 60° Fahr., and also soluble in alcohol and glycerin. It is not precipitated by solution of chloride of barium unless sulphate of soda is present, and as the latter is the most probable impurity when made in this way it is a good test of purity. When heated in a gas jet the acid is decomposed, leaving sulphate of soda and sulphuret of sodium.

Sulpho-Carbolate of Zinc is made by the direct process by saturating the hot aqueous sulpho-carbolic acid with carbonate of zinc free from iron, filtering and concentrating the solution at 150° F., and setting it aside to crystallize. The evaporation must not be pushed too far, else some sulphate crystals will be found. By throwing the mother liquid into sufficient alcohol, the sulphate will be precipitated and the sulpho-carbolate retained. This salt crystallizes readily in brilliant scaly crystals, which are soluble in two parts of water at 60° F., and in five parts of alcohol, according to Hager.

Sulpho-Carbolate of Lead.—This salt is easily made by saturating the hot watery solution of impure sulpho-carbolic acid with carbonate of lead, filtering hot and evaporating, if necessary, to the point of crystallization. As in making the baryta salt, the free sulphuric acid present is precipitated as an insoluble sulphate, thus separating it completely. It crystallizes less readily than the soda and zinc salts, is very soluble in water and soluble in alcohol and glycerin, is not precipitated by chloride of barium in weak solution, but gives the usual reaction with iodide of potassium and sulphide of ammonium, and its base is not precipitated by a current of carbonic acid. When, however, the salt is dried, on redissolving either in water or alcohol a residue is left, which is at once dissolved by acetic acid. Sulpho-carbolate of lead may be used as a cheaper substitute for the baryta salt to procure other salts by employing it in equivalent proportions with the sulphate of the base wanted—the lead falling as sulphate—when on filtration and evaporation the salt is obtained. Its therapeutical character is yet to be determined, but it is quite probable that in those diarrhœas where the acetate of lead is indicated, and especially those accompanied by a condition corrected by carbolic acid, this salt may be found

useful. Its solubility in glycerin and in alcohol will enable it to be used in lotions with advantage.

Sulpho-Carbolate of Lime is readily made by the same process, and in this case the free sulphuric acid is also separated in the process as sulphate of lime. The proportion of the acid is much larger in this salt than in some others. It is also soluble in less than its weight of water at 60° Fahr., soluble in alcohol and to some extent in glycerin.

Sulpho-Carbolate of Quinia.—When crude free sulpho-carbolic acid is saturated with pure quinia, an oil like compound is formed, which gradually dissolves in the water and has a dark brown color. Supposing the impurity of the acid was the cause of this condition, an alcoholic solution of sulpho-carbolate of lead was mixed with one of sulphate of quinia in alcohol, the solution filtered from the sulphate of lead and spontaneously evaporated, when the quinia salt separated in the same oily condition, but on standing some days it became a nearly white solid, with a crystalline structure. It is exceedingly bitter, not very soluble in water, but soluble in alcohol.

ON ZINC SULPHO-PHENATE.*

BY DR. HAGER.

The preparation of this salt presents no difficulties if pure crystallized phenol and pure monohydrate of sulphuric acid are operated on. Equal weight parts of both are digested at about 125° F. for two to three days. When the phenol is pure a clear, yellowish, thick liquid is obtained, which on cooling deposits conglomerations of crystals (probably uncombined phenol), but which soon congeals to a white crystallized mass. Although all conditions are present to combine all the sulphuric acid with the phenol, yet there remains always, and no matter how long the digestion may be continued, a surplus of about 10 per cent. sulphuric acid. For this reason it is advisable to mix 120 parts of sulphuric acid to every 100 parts of phenol. After two or three

* Translated from Dr. Hager's Pharmaceutischer Centralhalle, No. 1, 1870 (January 6, 1870), by Dr. F. Hoffmann.

days the combination is accomplished, and the mixture is then diluted with ten times its bulk of water. Now twice as much as the quantity of sulphuric acid operated upon, or better, a little more, of dry barium carbonate, is gradually added (to 120 parts (H Š, 245 parts Ba Ö). The latter had better be triturated with some water before it is added to the acid. Under evolution of carbonic acid barium sulpho phenate is formed, a salt soluble in water and in alcohol. At the same time any excess of free sulphuric acid is neutralized and transformed into barium sulphate. The whole is allowed to stand in a warm place for some hours, and is then filtered through a damp filter; the remainder on the filter is washed with some warm water. The filtered solution of barium sulpho-phenate may be evaporated to dryness, whereby it remains behind as a white salt deprived of its water of crystallization. This is soluble in two parts of water. A small quantity of this barium salt is retained, the balance is dissolved in water in the proportion of 10 parts of the first to 30—40 parts of the latter. To this filtered solution a solution of 6 parts crystallized zinc-sulphate in about 18 parts of water is added. Of this zinc solution a small quantity is also retained. Now, after leaving the mixture on the water bath for several hours, about 10 drops of the supernatant solution are diluted in a test tube with about 100 drops of water; this being divided in two parts, the one is examined with some drops of the retained zinc-sulphate solution, the other with the barium sulpho-phenate solution. If any reaction ensues in either case, the one or other of the retained solutions has carefully to be added to the bulk of the solution, in order to accomplish the exact decomposition. A slight excess of zinc sulphate should, however, prevail, so that the barium may be completely precipitated.

Finally, the filtered solution of zinc sulpho-phenate is evaporated under continual stirring until a drop, when allowed to fall on a cold glass plate, congeals to a salt mass. The liquid is then allowed to cool under frequent stirring, and the resulting salt mass is dried in a warm place. When completely dry it forms a white salt.

The evaporation of the solution of the barium sulpho-phenate, its re-solution and the filtration, are only required when a phenol

has been operated on which was not palpably pure. When this, however, is the case, the solution of barium sulpho-phenate may be decomposed, without any further operation, by the zinc-sulphate solution, with the precaution to retain some of the first solution in order to meet an accidental excess of the zinc solution. For every 100 parts of phenol operated upon, 152 parts of crystallized zinc sulphate may be added, of which only one-twelfth may be retained for further addition if required.

The preparation of zinc sulpho-phenate may be facilitated by the use of perfectly pure reagents. When they have been mixed and combined in the above stated proportions and process, the warm solution, after having been diluted with twice its bulk of water, is gradually neutralized with zinc-oxide (free of oxide of iron). When no more oxide is dissolved the warm solution is allowed to cool, and is then filtered; the filtrate is evaporated to nearly half its original bulk, and is then mixed and shaken with ten times its volume of alcohol (90—92 per cent.), and the mixture is allowed to stand in a cool place for several days. The zinc sulphate separates as a powder; the supernatant alcoholic solution of zinc sulpho-phenate may either be directly evaporated to dryness or the alcohol may first be restored by distillation, and the evaporation may then be accomplished. The residue is white zinc sulpho-phenate of a purity that it yields with barium chloride but a slight reaction.

One equivalent phenol, or phenyl-alcohol, forms, with two equivalent monohydrate of sulphuric acid, a compound ether, sulpho-phenic acid ($C_{12}H_5O, SO_3 + HO, SO_3$). This, when combined with barium oxide, forms $C_{12}H_5O, SO_3 + BaO, SO_3$,* and, with zinc oxide, the corresponding zinc salt. The barium salt, when crystallized from its aqueous solution, forms rhombic crystals, with three equivalents water of crystallization; the zinc salt, when crystallized, forms bright lamellas, with seven equivalents crystallization water. The officinal salt derived by exsiccation is deprived of the water of crystallization; it dissolves in two parts water of medium temperature, and in five parts alcohol of 90 per cent.

The preparation of zinc sulpho-phenate from a not quite pure

* Nomenclature and notation are that of Dr. Hager.

phenol yields different results. The sulpho-phenic acid is then dark colored, and the solutions of the salts therewith prepared have a pink color. The zinc sulpho-phenate when crystallized has a pink color; when desiccated, a reddish tint. This coloration, however, does not at all impair their medicinal value and their therapeutical action.

These more or less colored solutions of the zinc sulpho-phenate, when near the end of their evaporation, emanate a remarkably fine odor, resembling that of pelargonium. This observation may likely trace to a new source a fine perfume. Some of our most brilliant colors are derived from a similar origin.

Zinc sulpho-phenate combines the therapeutical virtues of zinc sulphate and of phenol. Its solution for injections is obtained by dissolving 1 part of the salt in 150 to 200 parts water.

REMARKS ON TITRATED SOLUTIONS OF OPIUM.

BY G. A. ZWICK.

To the Editor of the American Journal of Pharmacy :

If the remarks below be acceptable, you may insert them in your Journal. They are made, of course, without desire to criticise Dr. Squibb's article on this subject in your last number, but simply to present a view from the prescription counter as well as from the laboratory.

A titrated tincture of opium is no doubt of as much importance as the requisition of the Pharmacopœia—that the “concrete juice of the poppy” contains at least seven per cent. morphia. Dr. Squibb's suggestion, that the term “concrete juice” is entirely indefinite, according to the amount of moisture, is equally true and appropriate. He proves that it may contain all the way from seven to fifteen per cent. of morphia, and yet be within the pale of officinal requirements.

These points admitted, make an assay of opium, whether it be intended to be used as a powder or for the purpose of making tinctures, almost indispensable. I have tried Dr. Squibb's process, and succeeded with it, but it is probably better adapted for the laboratory than the apothecary, who would desire to examine opium without reference to liq. opii compositus (Squibb). For a quick and equally accurate result I would suggest the following:

Take 100 grains of powdered opium, triturate and work well with sulphuric ether in a mortar, with pestle, pouring off into a filter and renewing the ether until the opium ceases to impart color to the ether. After the filter and the opium have drained off and dried, turn them back into the mortar, cut up the paper with scissors, add warm water gradually, and work paper and opium into a pulp; finally add sufficient water to make an ounce or thereabouts, set this aside for twelve hours to macerate, then strain through flannel and return the expressed residue into the mortar, working it over as before with warm water; strain again, and repeat this manipulation until the washings become tasteless, or until the liquor ceases to acquire a reddish tinge with a drop each of nitric acid and tinct. chloride iron. This strained liquor is then filtered and evaporated, and worked for morphia, either according to Dr. Squibb's process (omitting the washing with ether, of course), or according to the Pharmacopœia process, observing Dr. Squibb's direction—to cover the liquor with a water joint. To be sure that no morphia is lost, the liquor should have 48 hours' rest. After the first day there is sometimes a small gain in crystals; that for morphimetric purposes it is not necessary to decolorize the crystals, Dr. Squibb mentions distinctly, and this is a great saving of time and morphine when working with small quantities.

Exhausting this powdered opium *dry*, with ether, will be found a saving of time and ether, as also, from actual trial, I found the manipulation of the opium in a mortar, and pressing the liquor through a strainer, to exhaust the opium with half the menstruum that is required to exhaust by washing through a filter. This same experience I have formerly often made in making tinctures; by using a powerful press it would only require half the amount of menstruum to exhaust that percolation needed to leave the dregs tasteless.

The number of grains of morphia obtained from 100 grains of opium of course represents the percentage, and it will also hardly be necessary to add that the same care and accuracy that is enjoined by Dr. Squibb in weighing, &c., is indispensable here.

As opium is cheapest about November and December, this would be the best time, as a rule, to lay in a supply for the year,

which could then be powdered and tested; and in this way uniformity could be obtained, by one or two tests, for an entire year.

In regard to the liquor opii comp., Squibb, I should be with the framers of our Pharmacopœia,—*i. e.*, regard it rather in the light of an extemporaneous prescription than a formula proper for the officinal list. It may be well to suggest a corrigent to physicians, and Dr. Squibb truly says, “physicians might take counsel in this direction occasionally to advantage;” but it is doubtful whether so active an addition ought to be made for general purposes, and by the addition of alcohol, which must be made to hold the chloroform and ether, the watery solution of opium which the Pharmacopœia intends is entirely lost sight of. Besides, the nature of ether and chloroform is such that the latter half of a 1lb bottle, unless used in large quantities, would probably contain little or none, or at least, as Dr. Squibb himself states, an indefinite quantity; and if this combination is not always desirable,—and this ought to be left to the judgment of the physician,—then the liq. opii comp. cannot displace or replace the tinctura opii deodorata of our present Pharmacopœia.

In Europe the tendency now is to simplify the Pharmacopœias, and establish a uniformity, abolishing complex formulas. This is instanced by the consolidation of the Dublin, London and Edinburgh Pharmacopœias, also the final adoption of a Pharmacopœia Germaniæ; further, a pressure to adopt universally the French system of weights and measures. A similar inclination should get a footing here, and I am sure Dr. Squibb is the last man to impede the wheel of progress. A multiplicity of formulas may work confusion. We have now an *old* compd. liq. opii, a *new* compd. liq. opii, and a compd. tinct. opium according to Dr. Squibb. Such formulas may be convenient to some,—supplying, as it is called in Germany, a *pons asinorum*,—but most physicians prefer to make their own prescriptions, though we have one doctor here who prescribes Dr. Squibb’s liquor opii comp. in quantities of six ounces, without regard to the admonition of Dr. Squibb himself, “that the greatest skill in using such preparations (if they are not to become hobbies) is to know when not to use them.” This same practitioner prescribes Wright’s Vegetable Pills, Marettrisi’s Catholicon, and Smith’s Wild Cherry Cough Balsam.”

Covington, Ky., Feb. 9th, 1870.

AROMATIC GLYCERATE OF RHUBARB—(GLYCERATUS RHEI AROMATICUS.)

BY H. TREVERTON BOND.

The introduction of glycerin has worked many radical changes in pharmacy, and that there are yet many uses to which this admirable substance can be applied there is not the slightest doubt. One of the most important purposes mentioned in connection with its further utilization is its substitution for sugar in the syrups at present in use. There are many reasons to suppose that quite a number, if not all, the present officinal syrups could profitably be replaced by glycerates. [See page 177 for *Glyceratus simplex*, by the same author.—EDITOR.]

The objections to syrups are well known and numerous. They are liable to ferment in the shelf bottles; they ferment in the stomach, and to many persons are nauseating and disgusting when taken in the quantity necessary to obtain a medicinal dose of the active ingredient or ingredients. One of the syrups that, in my estimation, can be very beneficially replaced by a glycerate is aromatic syr. rhei, and having succeeded in preparing such an article resulting in an elegant and handsome pharmaceutical preparation, I herewith send formula.

Take of Rhubarb, in moderately fine powder,	2½ troyounces.
Cloves, Cinnamon, each in fine powder,	½ troyounce.
Nutmeg, in moderately fine powder,	2 drachms.
Glycerin,	1½ pints.
Diluted alcohol,	1 “
Water,	q. s.

Mix eight ounces of the glycerin with the diluted alcohol, then mix the powders, and having moistened them with fʒiij of the mixture, introduce into a conical percolator and gradually pour on the glycerin and diluted alcohol mixture until a pint and a half of the tincture is obtained, (displacing the last portions, if necessary, with water); add the rest of the glycerin to the tincture, then add sufficient water to measure seven pints, and mix thoroughly together and filter.

The result is a handsome preparation, identical in strength with the syr. rhei. aro. of the U. S. Pharmacœpia, and possesses none of its objections while it has many advantages; it can be

administered in much larger doses, and thus reach cases where a syrup would be inadmissible on account of the sickening properties of the sugar, or where a tincture would be interdicted by reason of the stimulating qualities of alcohol.

The preparation has been exhibited to a number of physicians of respectability, and has, in every instance, met their unqualified approval.

Wheeling, West Virginia, Feb. 14th, 1870.

ON SOME CONSTITUENTS OF ERGOT.

BY J. CARL HERRMANN.

The author extracted 20 oz. finely powdered ergot with ether and obtained 6 oz. of a brown-yellow thickish non-drying oil, of an aromatic odor and acrid taste, at 18° C. of 0.92496 spec. grav., which at a lower temperature separated floccules of a solid fat.

4 oz. of the oil were saponified with caustic soda; during the boiling, traces of ammonia and trimethylamina were observed in the vapor. The crude soap had a brownish-yellow color, which remained in the mother liquor on salting out the soap; this gradually became sticky in the air. The fatty acids were separated by sulphuric acid and repeatedly boiled with water; the first portions of which assumed a golden-yellow color and separated a brown powder, which was similar in color to powdered ergot, retained a little fat, had an acrid bitterish taste, the odor of the oil, was insoluble in water and dilute acids, readily soluble in alcohol, ether and alkalies, and may be regarded as coloring matter.

The aqueous liquid was distilled, and small quantities of butyric and acetic acid were found in the distillate, while nearly half an oz. of glycerin was obtained by concentrating the residue left in the retort and treating it with strong alcohol.

The fatty acids were filtered in a water bath funnel, combined with carbonate of soda, and the soda soap in alcoholic solution precipitated by acetate of lead. The resulting plaster was washed with water and exhausted by ether. The undissolved powder contained 1.45 water, 59.10 oxide of lead and 39.61 fatty acid (mean). On evaporating the ether the lead soap was

left of the consistence of a soft extract, and yielded 1.72 water, 19.37 oxide of lead and 78.64 fatty acid (mean).

To determine the nature of the fatty acids, a portion was pressed between bibulous paper and repeatedly crystallized from hot alcohol; the dry crystals fused at 62° C., and congealed between 57 and 58° C.; they consisted of pure hydrate of palmitic acid. Ultimate analysis proved the correctness of this inference.

The extract, like lead soap, was decomposed by muriatic acid, and the fatty acid taken up by ether; it proved to be oleic acid.

The proportion of lead oxide to the acids is 5:4, and the fatty acids are 1 palmitic to 3 oleic acid; the composition of the plaster is, therefore, $C_{32}H_{31} (2 PbO) O_3 + 3 C_{36}H_{33} (PbO) O_3$. By the action of ether this was decomposed so as to yield a basic palmitate and an acid oleinate.

The coloring principle contained in the oil was obtained by treating it with ammoniacal alcohol, and evaporating the alcohol. It corresponds, the solubility in ether excepted, with Wiggers' ergotin, and to it the oil owes its color, aromatic odor and acrid taste.

The author also disproved the assertion of Manassewitz, that the oil of ergot was not saponifiable by caustic potassa.

Since Manassewitz did not succeed in isolating Wenzell's ecbolina, the author operated upon 30 oz. powdered ergot by nearly the process described by Wenzell (in Amer. Journ. Ph., May, 1864) and isolated the alkaloid, which possessed the appearance and reactions indicated by Wenzell. Herrmann also digested the precipitate by bichloride of mercury in Wenzell's process, with carbonate of lead, exsiccated the mixture and exhausted with 90 pr. ct. alcohol, which dissolved ecbolina, together with a trace of chloride of lead. The author promises further researches on ecbolina, also on Wenzell's ergotina and ergotic acid.

1000 grs. powdered ergot contained 50 grs. water, and yielded 22.01562 ashes, consisting of chloride of sodium, silica (14.67 pr. ct.) and potassa (30 pr. ct.) soda, lime, magnesia (4.88 pr. ct.) alumina, iron, manganese combined with phosphoric acid (45.12 pr. ct.)—*Wittstein's Viertelj. Schr.*, 1869, 481–497.

COLLODION.

By FREDERICK C. MUSSGILLER, of Brooklyn.

The officinal collodion is liable to at least two practical objections. The first is that it contains too little gun-cotton. And the second is that for surgical purposes, whether used of the present strength or stronger, the film contracts strongly, and is very liable to crack and present sharp edges, which irritate the parts to which it is applied, and favor the separation of the film at an earlier period than that at which it separates by reason of the cutaneous transpiration beneath it. The cantharidal collodion is also liable to the same objections, besides not containing cantharides enough to secure the effect for which it is used. The addition of more gun-cotton, of course, remedies the first objection; and the addition of a small proportion of castor oil or glycerin, or other non-drying substances, as is well known, render the film flexible and tough; but how much of either is proper or necessary, and how they are to be used, has not been well or accurately determined. In view of the approaching revision of the Pharmacopœia, a series of experiments upon the points here raised were undertaken, and the writer offers the following formula to the Association as a voluntary contribution:

Collodion is applied to two distinct uses in surgery. In one, its contractile force is rendered available in the compression of small tumors, etc.; in the other, it is used as a protecting coat or covering to prevent mechanical irritation and access of the air. The first use of course requires that the film should contract as much as possible, whilst in the second, and by far the most general use, the contraction is objectionable. The recent British Pharmacopœia meets this difficulty by providing two kinds, one called simply "Collodium," the other "Collodium Flexile," the latter containing Canada balsam and castor oil. The Paris Codex has only one kind, and uses castor oil alone. Glycerin, where properly used, is considered by some writers better than either, but it cannot be used as quoted in the U. S. Dispensatory, from MM. Cap and Garot. It is suggested that the U. S. Pharmacopœia supply two kinds, the flexible to be called simply collodium, but the old kind, which is comparatively

little needed, to be called collodium contrahens. The first may be prepared as follows :

Take of pyroxylin or gun-cotton, eighty-six grains.

Castor oil, eighty-six grains (or glycerin, sixty grains).

Stronger ether, three and a half fluidounces, or two troyounces and two hundred and six grains.

Stronger alcohol, one fluidounce, or three hundred and seventy-six grains.

Dissolve the castor oil (or the glycerin) in the stronger alcohol, add the ether to the solution, and dissolve the gun-cotton in the mixture by shaking. Should it contain visible floating particles, set it aside for a few days, and decant the collodion from the sediment. Collodion is a nearly colorless opalescent liquid, of a syrupy consistence, very liable to loss by evaporation, and dangerously inflammable. A small portion, say twenty or thirty grains, weighed in a counterpoised corked vial, and then exposed to spontaneous evaporation by removing the cork and laying the vial on its side till dry, loses ninety-one per cent. of its weight in four hours.

In comparing the formulas of some of the modern Pharmacopœias, no two were found alike, and the following are the percentages by weight of pyroxylin :

The U. S. Pharmacopœia gives 3.50 per cent.

“ British “ “ 2.60 “

“ French “ “ 7.00 “

“ Prussian “ “ 3. “

And the formula above given 5. “

of pyroxylin. Specimens of the present officinal U. S. Pharmacopœia Collodion, of the British “Collodium,” and “Collodium Flexile,” of the French, of the Prussian, and of the formula here proposed, are presented herewith, as well as specimens showing the effect of larger proportions of glycerin. All have been tried by the writer upon himself, and that which appears to yield the most durable and flexible film in summer weather is the collodion containing five per cent. each of gun-cotton and castor oil. It is observed that the smaller proportion of gun-cotton renders the film more contractile, and therefore for this variety the small proportion of the British Pharmacopœia is recommended. In

the writer's practice the cantharidal collodion has for some years past been increased, in the proportion of cantharides used, by ten per cent., but it is doubted whether this be a sufficient increase. It should always be made flexible or non-contractile, and therefore requires more gun-cotton. Specimens of both proportions are presented herewith.

The addition of a proportion of phenols, or carbolic acid, to the flexible collodion proposed, will often be found very useful and important. From one to ten per cent. of the coal tar creasote, or impure carbolic acid, may be conveniently added, and this mixture yields a film well calculated to replace many of the more complex and clumsy "carbolic acid plasters" in use.

List of Samples of Collodion.

Number.	Percentage of Gun-Cotton.	Percentage of Glycerin.	Percentage of Castor Oil.	Percentage of Canada Balsam.	Percentage of Cantharides.	Percentage of impure Carb. Acid.	Remarks.
1	3.50						Strictly officinal.
2	3.99						10 p. c. increase.
3	4.4	2.48					Clear.
4	4.4	3.					Slightly cloudy.
5	4.4	3.7					Cloudy.
6	4.4	4.4					Slightly milky.
7	4.4	4.62					Milky.
8	4.93	4.93					Milky.
9	3.						Prussian Pharmacopœia.
10	2.6						British Pharmacopœia.
11	2.6		2.65	5.45			British Flexile.
12	7.00		7.00				Paris Codex.
13	5.		5.				Best flexible film.
14	4.4		4.4				
15	7.53	7.53					Milky and dense.
16	7.53	5.					Slightly milky.
17	7.53	3.76					Clear.
18	1.9				$\frac{1}{2}$ grain to a minim.		Strictly officinal.
19	3.				6-10 grain to a minim.		10 p. c. Canth. more.
20	5.		5.			1	Phenaten.
21	5.		5.			2	"

It is suggested that all these specimens be referred to the Committee on Specimens for report.

Brooklyn, Sept. 2d, 1869.

—Proc. Amer. Pharm. Assoc., 1869.

EXAMINATION OF THE DEPOSIT FROM TINCTURA
RHEI, U. S. P.

BY JAMES T. KING.

The yellow deposit in a storage bottle of tincture of rhubarb, U.S.P., was collected on a filter, washed, and dried until it ceased to lose weight.

Ten grains of this was treated with liquor potassæ until no more would dissolve; it was then filtered, washed and dried.

The portion insoluble in potassa consisted principally of extractive.

The filtrate was supersaturated with hydrochloric acid and filtered; the precipitate, well washed and dried, weighed 8 grs. This was treated with chloroform, and the solution allowed to evaporate spontaneously; when well dried, was weighed, giving 5.4 grs. of nearly pure chrysophanic acid. The 2.6 grs. insoluble in chloroform were destitute of any taste of rhubarb, soluble in alcohol; on platinum foil with heat it fused, then ignited, giving off a yellow flame, leaving no ash or residue. It is probably resin. Finding in the deposit so large a per cent. of chrysophanic acid, which is supposed to be one of the more active principles of rhubarb, the following experiment was made to determine what portion of the soluble matter of rhubarb would be precipitated in a given time.

One pint of the tincture of rhubarb was made according to the U. S. P. The materials weighed 840 grs. When the tincture was finished, the drug appeared to be exhausted of all matter soluble in the menstruum. The undissolved portion was dried on a water-bath, and weighed 443 grs., showing a loss of 397 grs. By previous examination the rhubarb was found to lose 10 per cent. of moisture; this would leave 313 grs. of matter in solution.

The tincture was placed on a shelf in the store room exposed to the diffused light, and occasionally opened. At the expiration of eight months it was filtered, the precipitate washed and dried. It weighed only 3.1 grs.,—about one per cent. This was treated with potassa and hydrochloric acid in the same manner as the other precipitate or deposit, and gave 1.2 grs. chryso-

phanic acid. The small amount of precipitate shows that the tincture would not deteriorate within a reasonable time for dispensing the same.

Before ascertaining that the deposit bore so small a proportion to the matter held in solution, I had prepared four samples of tinctures, using for No. 1 the officinal formula; No. 2, the rhubarb in moderately coarse powder, 2 parts alcohol and 1 part water; No. 3, rhubarb in fine powder and stronger alcohol; No. 4, rhubarb in moderately coarse powder, 2 parts alcohol, 1 part water, and 1 part glycerine.

The materials in each percolator appeared to be exhausted, and were nearly tasteless; the tinctures 2 and 4 resembling the officinal preparations in appearance, No. 4 being sweet, and having the taste of rhubarb somewhat masked. No. 3, or alcoholic tincture, was of a light wine color.

These four tinctures were placed on a shelf in the saleroom, subject to the same light and treatment as in the first experiment. Within a few days a deposit commenced forming in each, —much the least in No. 3,—and at the expiration of eight months a yellow deposit covered more or less thickly the bottom of each bottle.

Each tincture was filtered through a tared filter, precipitates washed with distilled water, dried until they ceased to lose weight, and weighed.

Deposit in No. 1,	light yellow color,	4.5	grs. to pint.
“ “ 2,	yellowish-brown color,	2.4	“ “
“ “ 3,	reddish	2.0	“ “
“ “ 4,	yellow	4.4	“ “

These deposits were examined only qualitatively. Nos. 1 and 4 gave indications of considerable chrysophanic acid, No. 2 much less, and No. 3 but a trace.

It is evident that a tincture made with the stronger alcohol will retain all the active principles in solution, or, if so much alcohol would be objectionable, a tincture made with two parts alcohol and one part water would be nearly as permanent.

Middletown, N. Y., Sept., 1869.

—*Proc. Amer. Pharm. Assoc., 1869.*

REMARKS UPON THE PREPARATION OF FLUID EXTRACTS,

BY THE PROCESS PROPOSED BY MR. SAMUEL CAMPBELL, OF PHILA.

BY ALFRED B. TAYLOR.

Many of you have no doubt read an article upon the preparation of fluid extracts, published in the September number of the *American Journal of Pharmacy*, on page 385.

From the importance of the principles involved, and the bearing they are likely to have upon our National Pharmacopœia, I have thought that some remarks upon the subject might be profitable as well as interesting.

I herewith submit to your inspection samples of all the fluid extracts officinal in the U. S. Pharmacopœia, with the exception of two or three, and of several others that are not officinal, prepared by Mr. Campbell, in accordance with his suggestions. I have here also the residues from which these extracts have been prepared. Examination of these specimens will show not only the quality of the various extracts, but also the completeness with which the different drugs have been exhausted.

The importance of long maceration as a requirement for thorough and concentrated exhaustion of a drug by percolation, is so marked and decided, and the results obtained so wonderful, that it is certainly somewhat remarkable that they have not hitherto been noticed. The theoretical idea that long maceration would be beneficial, may have suggested itself to others as it did to myself a long time since, but its immense, unexpected practical importance has not been appreciated until these experiments of Mr. Campbell.

In order to test the subject more thoroughly, and to satisfy myself fully as to the importance and efficiency of maceration, the following experiments were instituted.

Three separate portions of yellow cinchona of four troy ounces each, in moderately fine powder, were carefully displaced with diluted alcohol; one portion having been allowed to macerate half an hour (according to the directions of the U. S. Pharmacopœia in making fluid extract of cinchona;) another portion having been allowed to macerate for 48 hours; while the

third portion was allowed to macerate for four days ; the conditions of all being made as nearly alike as possible, in regard to temperature, packing, pouring on the menstruum, &c. The displaced tincture was carefully collected in portions of one fluid-ounce each ; each ounce was then evaporated separately, and the weight of solid extract furnished by each ounce carefully noted. The following results were obtained :

Percolate No. 1.

The 1st oz. yielded of solid extract,	94 grs.
“ 2d “ “ “ “ “	80 “
“ 3d “ “ “ “ “	60 “
“ 4th “ “ “ “ “	45 “
The first pint after this yielded of solid extract,	102 “
“ 2d and 3d pints “ “ “	78 “
And 3 pints additional “ “ “	40 “
	<hr/> 499

Percolate No. 2.

The 1st oz. yielded of solid extract,	185 grs.
“ 2d “ “ “ “ “	90 “
“ 3d “ “ “ “ “	65 “
“ 4th “ “ “ “ “	45 “
“ Pint after this yielded of solid extract,	115 “
	<hr/> 500

Percolate No. 3.

The 1st oz. yielded of solid extract,	200 grs.
“ 2d “ “ “ “ “	143 “
“ 3d “ “ “ “ “	90 “
“ 4th “ “ “ “ “	30 “
And 8 oz. after this, to exhaust, yielded	48 “
	<hr/> 511

Upon examination and comparison of these results, it is found that the total yield of extract is almost identical in the three experiments. Four ounces of bark having yielded in one case 499 grains, in another 500, and in the third 511 grains of solid extract, being about 26 per cent.

The first ounce of percolate, after half an hour's maceration, yielded of extract,	94 grs.
The first ounce, after 2 days maceration, yielded	185 "
" " " " 4 " " "	200 "
The first 4 oz. of percolate, after one day's mace- ration, yielded of extract,	279 grs.
The first four oz., after 2 days maceration, yielded	385 "
" " " " 4 " " "	465 "

Or upon comparing the first and third experiments, the first three ounces of percolate, after long maceration, yielded as much solid extract as three ounces and two pints additional after a short maceration. It will also be observed that, after four ounces of percolate had been obtained, eight ounces of menstruum exhausted the drug that had been macerated four days, more thoroughly than six pints, where it had been macerated for half an hour.

If, upon further investigation, it should be found that the exhaustion of some particular articles is not complete, the passage of a small additional amount of menstruum, and the reduction of the product by spontaneous evaporation to the required measure, would no doubt successfully accomplish the desired end.

The longest time allowed for maceration in any of the experiments made by Mr. Campbell, or myself, was four days. It is possible that in some cases even a longer maceration might be found desirable, but since the results of all the experiments tried were satisfactory, no further experiment as to time was tried.

From the results of the preceding experiments, it might be thought that the use of glycerin is superfluous, since diluted alcohol appears to be sufficient to exhaust the drug; yet I believe that in this and in many other cases, it is a valuable part of the menstruum; not only from its solvent, but also from its preservative power; but whether the proportion adopted is the best one, can be determined only by experiment. It is not probable that the same proportions would be desirable for all drugs.

In regard to fineness of powder for making fluid extracts, I believe that for all of the fluid extracts at present officinal in

the Pharmacopœia, a powder moderately fine, or one that would pass through a sieve No. 50, would be preferable to the one adopted by Mr. Campbell, which is moderately coarse, or one that would pass through a sieve No. 40. Almost any drug can be reduced to this degree of fineness, without involving much more labor or time than is required to reduce it to a moderately coarse powder. Of the 23 fluid extracts now official, in which fineness of powder is indicated, eleven are directed to be made from moderately fine powder (No. 50,) and twelve from fine powder (No. 60); these two grades being the only ones indicated.

When powders finer than No. 50 are directed they will rarely be prepared by the apothecary, but will be purchased from the wholesale druggist, or the drug grinder, and will consequently be much more liable to be inert, impure or adulterated than when powdered under the supervision of one who wishes to prepare his own extracts.

Two of the fluid extracts of the Pharmacopœia, viz., those of hemlock and ergot, have a small quantity of acetic acid added to the menstruum; and this is a very useful addition to those preparations when made according to the formula of the present Pharmacopœia. The main object of this addition is to give stability to the alkaloids during the process of concentrating these extracts by heat; it is also incidentally useful in promoting the solubility of the alkaloids, and in preserving the preparations when finished. These objects are all accomplished by the process of Mr. Campbell, without the addition of the acid. No heat being used in the process, all danger of destruction from this cause is avoided. The menstruum being sufficient to completely exhaust the drug, no addition is required, while the glycerin is perhaps a better preservative of the finished preparation than acetic acid.

As Mr. Campbell has well said, a fluid extract should represent the drug from which it is prepared, giving the constituents, as nearly as possible, as they exist in the crude drug; and although acidulated preparations of cinchona, opium, conium, &c., may be desirable, it is at least questionable whether acetic or any other acid, whereby the natural composition is changed,

is a proper addition in the preparation of simple fluid extracts of these substances.

Mr. Campbell, after moistening the drug upon which he is operating, packs it in a percolator and allows it to macerate therein for four days, after which he proceeds to displace the tincture. By this process the portion in the bottom of the instrument is subjected to a more thorough action of the menstruum than that near the top, and while the lower portion would be entirely exhausted, it might perhaps be doubted whether the upper portion was equally so, although long maceration seems entirely to loosen the soluble from the insoluble portion, while percolation merely washes out the soluble part so separated. I would suggest that the maceration should not be made in the percolator, but in a separate vessel, and that once or oftener during the maceration it would be advisable to thoroughly stir the mixture, since the upper part would naturally become dryer than the lower. By this means the maceration would be made more uniform throughout the mass, while at the same time there would be less danger of the menstruum running in particular grooves or channels. In the case of resinous or gummy substances, previous to percolation, I would recommend the addition of sand, washed sawdust, the residue of a previous operation, or some other inert substance, whereby a freer passage may be given to the menstruum, care being taken to have the mixture uniform, and the packing in the percolator being carefully attended to.

Mr. Campbell recommends the use of glass funnels or percolators in all cases, and it is probable that there are very few instances in which they will not answer a good purpose. From the experience I have had, however, in the use of percolators of various shapes, I believe that the best form of percolator is the section of a cone having about the following proportions: its length should be twice that of its largest diameter, and four times that of its smallest diameter. If made of glass, the smaller end should terminate in a rounded funnel with a short neck; if made of tinned iron, an ordinary funnel makes a very good termination.

In view of the great simplicity of this process, and the ease

with which fluid extracts can be thereby made, I strongly recommend it to the consideration of the Committee of Revision and Publication of the U. S. Pharmacopœia, believing that the best preparations possible can be thus obtained, and with the greatest economy of labor or expense.—*Proc. Amer. Pharm. Assoc.*, 1869.

GOLCOINE, GLYCONINE.

BY JOSEPH HIRSH.

The bottle labelled glyconine excited some interest in the exhibition-room, at least as far as its name is concerned, and the frequently repeated question of what it was or meant may be my apology for mentioning it to this learned body. Under the name of golcoine, our literature mentioned, some two or three years ago, an ointment consisting of four parts of yolk of egg and five parts of glycerin, recommended especially as an application to sore nipples, where it not only exerted a decidedly healing influence, but did also not interfere with the suckling of the child, from the fact that it is neither poisonous nor disagreeable to the taste, while its great pliability and elasticity render it above all ointments applicable to this especial purpose.

Its recommendation by the pharmaceutical and medical press seems to have made but a faint impression upon the public, most interested in this matter, if I am to judge by the rapidity with which even its name was forgotten. Having sent a sample, labeled golcoine, to the last Exhibition of the American Institute of N. York, which I was prevented from attending personally, I had the mortification to learn, upon a later visit in N. York, that a prominent chemist of that city, who also exhibited chemicals at the present fair of this Association, had the bottle mentioned very carefully, but very promptly, removed from the exhibition-room, and thrust into some out of the way place, deeming this the smallest part of his duty as member of the Committee on Chemicals. He had, in his honest zeal, mistaken the name golcoine for glonoine, and though greatly irate at the carelessness on my part in exposing the valuable exhibition, together with the more valuable visitors and attendants, to the danger of glonoine or nitro-glycerin, the tragical end of the

bottle had also its exhilarating effect upon closer examination. Lately the same substance has been mentioned again, under the less suspicious name of glyconine, which though to me seems hardly expressive of the nature of the substance, since many others may, with equal right, claim this name, which expresses only their sweetness, unless we turn the philological somersault of affixing some value to the innocent conine ending of the word. If the writer had not such a respectful horror of authorities and established things, he would suggest *glycerodine* as the true expression of the nature of the preparation, since the constituents of the egg are all present, even if a great part of its albumen has been removed with the whites. Knowing from personal observation the usefulness of the article considered for the purpose recommended above, I would add, that time does neither destroy nor modify this healing effect of glyconine, even after an exposure of more than a year to atmospheric influence, which by *good* glycerine seems to be kept perfectly at bay, while without it the yolk, like all protein substances, is rapidly decomposed. This last fact, above all others, perhaps excluded the use of yolk in pharmacy, although it has been exceptionally employed in some disorders of the scalp, either in the shape of the entire yolk, or in that of the oil extracted from the same, as also in the shape of soap, which in Europe is manufactured to some extent.

This property of stability of this glycerole will recommend its general use as soon as it is more known.

Considering the constitution of the yolk, it occurred to me that this glyconine would form a very efficient dietary article, and would fill a vacancy which still exists, in spite of the different preparations of bran offered for sale in the drug market. They contain a large amount of nourishing proteine, but upon it alone their merit rests.

If we examine, on the other hand, the yolk of the egg, we find the yolk corpuscles and fat globules, the last named of which may be distinguished under the microscope by their less intense yellow color. These fat globules are very rich in phosphorised matters, which may be separated by extraction of the yolk with ether, which, upon evaporation and incineration of the

residue, leaves behind the superphosphates of the alkalies and of lime. The fat consists of oleine, margarine, mixed, according to Goble, with a large amount of glycerophosphoric acid, as also with cerebrin, also known as cerebrie or oleo-phosphoric acid. This last named acid contains nitrogen and phosphorus, and is also found as a constituent of the brain. The presence of cholesterine, the fat of the bile, has also been determined in the yolk, which contains of it on an average 0.438 per cent.

Of the two pigments of the yolk, the yellow and the red, which both are soluble in alcohol, the red one contains iron. Besides this metal other minerals are contained in the yolk, as hydrochlorate of ammonia, potassic compounds, which greatly predominate over the chlorides and phosphates, found in the ashes only monobasic. The ashes contain as much as 70 per cent. of phosphoric acid, 1.45 per cent. of peroxide of iron, and about 0.55 per cent. of silica. Altogether we find here the constituents of the blood ready formed in the same proportion as they are contained in that fluid, besides some constituents of the brain and bile, which accounts for the easy digestibility of the yolk, its assimilation not taxing the digestive organs in as high a degree as a dietary article of a more remote constitutional resemblance. To complete this sketch of similarity we find the vitelline, a compound of caseine and albumen, easily soluble in even dilute solutions of the neutral salts, the presence of which in the yolk I mentioned, and easily convertible into peptones. As much as 17 per cent. of vitelline are present in the yolk. For practical use as a dietary preparation, I would suggest the addition of sugar to the glyconine, to render it dry and solid, while the addition of syrup would produce a pleasant tasting liquid preparation, which besides in its natural state, might be used as a vehicle for various drugs, as the tonics, &c.—*Proc. Amer. Pharm. Assoc.*, 1869.

MANUFACTURE OF SULPHIDE OF CARBON.

By M. CONTET.

As a proof of the greatly improved mode of manufacture of this substance and its very extensive use, the author begins by stating that, in 1840, the kilo. of rectified sulphide of carbon

cost 50 francs (£2); in 1848, M. Deiss manufactured and sold it at 8 francs per kilo., and now it may be had wholesale at 50 centimes the same quantity. The apparatus now in use consists of vertical retorts made of the same kind of clay as is in use for glass-pots; these retorts are 1·8 metre high by 0·50 internal diameter, they are lined internally with a glaze composed of 130 parts of flint glass, 20 parts of carbonate of soda, and 12 parts of boracic acid fused together, and next pulverised and painted on the inside of the retorts with gum water (at the first heating of the retorts this mixture yields a glaze which entirely closes the pores of the material, thus preventing escape of vapors and gases); four of these retorts are set in one oven made of brick-work, and are heated by a properly constructed furnace; the retorts are provided with the necessary tubes for the abduction of the vapors of the sulphide of carbon, and the introduction of the charges of sulphur and charcoal; the operation once commenced is continuous, since the retorts last for at least six months; the consumption of sulphur per retort amounts to 125 kilos. in 24 hours, introduced in charges of 155 grms. each, every three minutes time; the vapors of the sulphide of carbon are collected and condensed in vessels made of zinc or sheet-iron, and shaped like flattened down casks, and entirely covered over with cold water constantly refreshed, while the contrivance is so arranged as to keep the sulphide under water also (its specific gravity is 1·265, and its boiling point 45°). The most suitable temperature for this manufacture is bright red heat; the raw liquid obtained has to be re-distilled, and this operation is conducted in large iron vessels, which contain some 5000 kilos. at the same time and communicate with six worm condensers; steam is used for heating by means of a serpentine-coiled set of pipes, and the liquid is heated to 48° ; near the end of the distillation the temperature is raised to 100° , in order to drive off a raw product containing very much sulphur dissolved; in the distillatory apparatus some sulphur remains; which is removed and again applied; it appears that this industry has become very extended and is carried on with great success in France.—*Chem. News*, Jan. 7, 1870.

RENDERING COMMERCIAL SULPHIDE OF CARBON
INODOROUS.

BY M. CLOES.

The author states that, when sulphide of carbon is left for twenty-four hours in contact with half per cent. of its weight of finely-powdered corrosive sublimate, care being taken to shake or stir up this mixture, the mercurial compound combines with the substances which are the cause of the fœtid odor of this substance, and an insoluble compound is deposited. The liquid is carefully decanted, and, after 0.02 of its weight of a pure inodorous fat has been added (no reason is given for this addition), the sulphide is re-distilled with care by the heat of a water-bath. The sulphide thus obtained exhibits an ethereal odor, and is eminently suitable for the extraction of oils, fats, &c., from various substances, since, on evaporation of the purified sulphide, these matters are obtained in as fresh and pure a state as if the oils had been obtained by pressure.—*Chem. News*, Jan. 14, 1870.

PHARMACY IN CANADA, 1869.

BY J. BAKER EDWARDS, Ph.D., F.C.S.

The second annual reports of the two Canadian societies for the promotion of pharmaceutical science having just appeared almost simultaneously, a fitting opportunity is afforded of reviewing the general position of pharmacy in British America, and the efforts now being made to obtain restrictive legislation.

The first of these societies has assumed the somewhat ambitious title of the "Canadian Pharmaceutical Society." As, however, one of its leading objects was legislation, and this legislation could only extend to the upper province, it is obvious that the "Pharmaceutical Society of Ontario" would have been a more legitimate and correct title. I must, moreover, be allowed to express the feeling that the time-honored titles "Pharmaceutical Society" and "Pharmaceutical Journal" have been fairly earned by our "Alma Mater," and that provincial societies would do well to show their originality by adopting some other designation for their associations. This remark also applies to the Bill which has been brought before the Ontario Legislature,

and obtained a first reading. It is so closely a copy of the Pharmacy Act, that some of its provisions may not prove best adapted to the circumstances of thinly populated country districts. The Society proposes to undertake the work of education, and to fit up a laboratory, library, and museum; and its first year's class in chemistry has been very successful, about forty students having been enrolled, several of whom passed creditable examinations at the close of the session. It has also encouraged its country members by offering three prizes "for collections of indigenous medical substances of vegetable origin," competitors to be "*members of the Pharmaceutical Society,*" (*sic!*). It has produced a useful monthly periodical, called the "Canadian Pharmaceutical Journal," which is, however, largely indebted to extracted matter. This has obtained a fair circulation.

The report does not give the number of members, but states that 129 were added during the year; from which we may assume the number to be from 300 to 350. These are principally country members, residing in the numerous small towns of Ontario. The prospects of this Society are very encouraging, and it will, no doubt, accomplish much good.

The constitution, aims, and resources of the Montreal Chemists' Association are modified by its circumstances; its members are almost entirely confined to this city, and it has a large number of Associate members. It has also undertaken the work of education, and has completed one session, during which a course of lectures on *Materia Medica* was delivered by Dr. Kollmyer, and on Chemistry by myself. About fifty practical students attended, with very satisfactory results.

The second year's courses are now about to commence, with an entry of about forty students. As these are all city *employés*, the number indicates a very general support. Our monthly meetings are also well attended, and practical subjects are brought forward and discussed.

In the matter of legislation we have prepared a Bill of a very simple character, which we expect to pass shortly. It constitutes a separate body, "The Quebec College of Pharmacy," for the purposes of registration, examination, and licensing graduates in

pharmacy, and prohibits the sale to the public of certain poisons of a dangerous character, except by persons duly qualified and registered under the Act.

There is very little pure pharmacy among the French Canadians, the French druggists generally being qualified practitioners of medicine. The Bill, therefore, chiefly concerns the English-speaking population, and will encourage the establishment of pharmacies in market towns where few now exist. In the province of Quebec, the power of examination in pharmacy is now vested in the College of Physicians and Surgeons of Lower Canada, though few avail themselves of the privilege. The movement is looked upon favorably by leading members of the medical profession, and we trust the result will be for the advancement of pharmaceutical education and status in the province.

Of our friends in New Brunswick and Nova Scotia, we hear and see very little. The long distances and sparse populations render our intercourse with them very limited, even now that Confederation is an accomplished fact. It is to be regretted that the Pharmaceutists of the Dominion cannot be enrolled into one body; but so long as all matters of education are in the hands of a divided provincial Legislature, this cannot be. The same difficulty is experienced in the States, and efforts are now being made there to assimilate the various State laws in reference to pharmacy. Every voluntary movement will assist towards general legislation, and we feel that the example of Great Britain will be most influential in placing pharmacy in its right position among all civilized communities.—*Pharm. Journ., Dec., 1869.*

MEDICINAL ACTION OF PAPAVERINE.

Papaverine, one of the alkaloids of opium, which was stated by M. C. Bernard to possess no narcotic property, has been studied physiologically by MM. Liederdorf and Bresslauer. Their experiments were made on the insane. They find that papaverine exercises upon man a decided soporific action, and, at the same time, diminishes muscular activity. It reduces the frequency of the pulse in all cases, and its calming action is not

preceded by a period of excitement. It never causes nausea, vertigo, headache, or constipation, but, on the contrary, tends to reduce these symptoms. It generally acts slowly, about four to seven hours after administration. It may be given subcutaneously in the form of hydrochlorate. Dr. Stark fully confirms these observations; he administers it in doses of 1 to 2 grains by hypodermic injection, and considers it to be constant and simple in its action.—*C. H. Wood, F.C.S., in Pharm. Jour., London, Dec., 1869.*

HISTORICAL NOTES ON MANNA.

BY DANIEL HANBURY, F.R.S.*

Whatever was the true nature of the substance provided for the sustenance of the ancient Israelites and termed by them *Manna*, that name has in subsequent ages been used to designate certain saccharine exudations produced in hot countries upon the stems, branches or leaves of trees, shrub, or herbaceous plants, belonging to various families. Thus in the peninsula of Sinai, a sweet substance called *manna* is exuded by a species of tamarisk; in Persia, a manna is produced by a small, thorny, leguminous plant, known to botanists as *Alhagi Maurorum*; and in Kurdistan, an evergreen-oak affords an analogous product. These substances have from a remote period been employed as food or medicine, and they are still found, though in small quantities, in the bazaars of the East. The Cedar of Lebanon, the Larch, a *Cistus*, and certain Australian species of *Eucalyptus* likewise yield, at certain seasons, saccharine exudations in more or less abundance; and those derived from the cedar and larch have occasionally been collected for use.

The manna of modern times is well known to have a very different origin, being a product obtained in considerable abundance from the stems and branches of a species of ash, cultivated in Calabria and Sicily. With this manna, Europe is wholly supplied, and it likewise finds its way into the markets of the East.

During some conversation last summer with my friend Dr. Flückiger of Berne, he drew my attention to this curious fact,—that in the early history of Sicily, no mention is made of manna

* From the Author's revised reprint from *Pharm. Journ.*, London.

as a production of the island. This induced me to look around for further information, the result of which has been the collection of a few notes on the history of this drug, which seem of sufficient interest to be presented to the Pharmaceutical Society.

In the first place, I must thank Colonel Yule, to whom I wrote, thinking that his familiarity with historical research, and actual residence at Palermo, might enable him to impart some hints for my guidance. But he has been good enough to render me still greater service in furnishing extracts from several authors whose works I might otherwise have overlooked.

With regard to manna which has fallen from the atmosphere, or, as it is termed, *Meteoric Manna*, the grand example is that described in the book of Exodus. Of this it may be safely affirmed that, accepting the Mosaic account as the simple narrative of a real event, no phenomenon is known which is at all adequate to explain it.

But there are other examples of meteoric manna which come fairly within the range of natural phenomena, and which it would be interesting to consider, did space permit. I may observe that the notion that manna is not the juice of a plant, but that it is of the nature of dew and falls from the sky, is very ancient, and still lingers in the East. In the case of the manna-ash, it was disproved by the Franciscan monks Angelus Palea and Bartholomæus ab Urbe Vetere, who relate how they caused some of the trees to be covered with sheets, so that nothing could fall upon them; and that notwithstanding this precaution, manna was produced as before.* But this reasonable conclusion was regarded as scarcely orthodox, and the learned Matthioli was at much pains to supply an explanation more, as he thought, in accordance with Scripture.

The special point, however, which I desire to discuss in this paper relates to the *period* at which ash-manna began to be collected. Manna is mentioned more or less particularly by most of the Arabian physicians with whose works we are more or less acquainted, but the allusions are all to Oriental manna and not

* Geoffroy, *Tractatus de Mat. Med.* II, 587. The whole disquisition of this author *De Mannâ solutivâ*, is replete with information.

to that of Italy or Sicily. This is manifest from the writings of Ebn Beithar,* one of the most eminent and learned men of his time, and a great traveller; and who, being a native of Malaga, would probably when speaking of manna have named that of Sicily, the more so as that island, having been for nearly 250 years under Saracenic rule, must have been familiar to the Arabs of Spain. Ebn Beithar is moreover in the habit of quoting extensively from other authors. He died about A. D. 1248.

One fact may be held to prove that the Saracens could not have been entirely ignorant of the production of manna in Sicily, and it is this:—There exists a mountain near Cefalu which is called by the Arabic name *Gibil-manna*, literally *Manna-mountain*.† Other mountains in the island retain the Arabic name of *gibil*: whether the word *manna* was affixed subsequently to the Saracenic occupation, or whether, as is more probable, the whole name was bestowed by the Arab population in virtue of the trees of the mountain yielding manna, is a point I am unable to decide.‡

In the 13th century, Sicily was under the dominion of the Emperor Frederic II, a sovereign who appears to have been very solicitous to develop its resources, as is proved by many documents extant, relative to the affairs of the island. Thus in a letter dated A. D. 1239, he directs that certain Jews settled at Palermo are to farm his date plantations at Favara, and to cultivate them after their own manner. He also writes about the cultivation of his vineyards and the introduction of indigo and senna, and of divers other plants of Barbary, not then known to grow in Sicily. But so far as I can discover, there is no allusion to manna.§

Pegolotti, an Italian who wrote a sort of mercantile handbook *circa* A. D. 1340, has a chapter on Messina and Palermo, but

* Ed. Sontheimer, 1840-42, I, 207, II, 533.

† Amico, *Lexicon typographicum Siculum*, III (1760), 242.

‡ Colonel Yule has remarked that Salmasius in his *Exercitationes Plinianæ*, alludes to *Σικελικὸν μάννα* as mentioned by the *Medici recentiores Græci*, but without specifying more particularly who they are.

§ *Historia diplomatica Friderici Secundi*, par J. L. A. Huillard-Bréholles, T. iv, 213; T. v, 571.

does not mention manna as a production of Sicily; yet in enumerating the articles sold by the pound at the former city, he names manna apparently as a foreign production, since he couples it with cloves, cubebs, rhubarb, mace and long pepper.

Further evidence of a negative sort is afforded by Giovanni di Antonio da Uzzano, who in his work called *Libro di Gabelli*, written circa A. D. 1442, mentions the exports of Naples and of Calabria as wine, oil, corn, cheese, salted meat, nuts, chestnuts, soap, and oranges, but makes no reference to manna.*

The earliest actual mention of manna as an Italian drug that I have found, is in the *Compendium Aromatariorum* of Saladinus, printed at Bologna in 1488. Saladinus was physician to one of the Princes of Tarentum in Calabria; neither the date of his birth nor that of his death is known, but it would appear that he was living between A. D. 1442 and 1458; for he states that during his time, the King of Arragon punished his druggist at Naples by a fine of 9000 ducats and degradation from office, because the king's physicians having prescribed *white coral* as an ingredient of a cordial electuary, the druggist not possessing it, substituted *red coral*. This incident affords a clue to the age of Saladinus, for it was Alphonso V, King of Arragon, who laid siege to Naples, captured it in 1442, and died in 1458.

The work of Saladinus to which I have alluded, is a sort of handbook for the *aromatarius* or druggist, and is remarkable for much practical good sense. Besides numerous formulæ and descriptive notices of drugs, it contains a calendar enumerating the herbs, flowers, seeds, roots and gums to be collected in each month; and in terminating the list for May, there occurs the following passage:

“Collige etia in isto mese mana ta in oriete qm: in Calabria quia tunc ros ille preciosius de celo cadit.”

* Pegolotti's work forms the third volume, and Da Uzzano's the fourth, of the book published anonymously by Gian Francesco Pagnini under the title of *Della Decima e di varie altre Gravezze imposte dal Commune di Firenze*, etc., Lisb. e Lucca, 1765-6, 4^o, III, 99; IV, 96-98. Some valuable information on Pegolotti and his writings may be found in Col. Yule's *Cathay and the way thither*, Lond. 1866 (Hakluyt Society), Vol. II, 279.

Contemporary with Saladinus lived Giovanni Gioviano Pontano (A. D. 1426—1503), a celebrated historian, statesman, philosopher and poet. Among his numerous writings is a work entitled *Liber Meteororum*, in which there is a poem headed *De Pruind, et Kore, et Mannâ*; this effusion notices in very circumstantial terms the collection of manna by the peasants on the banks of the Crati in Calabria, describing the production of the drug in language which may be rendered thus :

* * * “There in the middle of summer, under a burning sun, while heat prevails and the cloven earth gapes—when no breeze is stirring, and the humid air is still, it [the manna] gradually exudes, and, condensed as a viscid fluid, runs into drops and thickens on the thirsty leaves—and, further hardened by successive suns, it acquires the appearance of wax, and the taste of honey. Such as the bees obtain by their instinctive art and mutual aid, this, nature produces for the medicinal use of mankind.”

I subjoin the passage in a foot-note.*

In the second half of the fifteenth century flourished Raffaele Maffei, called also Volaterranus, a learned and voluminous writer, who among other works has left one entitled *Commentarii Urbani*, in which we find a sentence in the following words :†

“Manna nostra ætate cœpit in Calabria provenire : licet orientali inferior.”

* Quinetiam Calabris in saltibus, ac per opacum
Labitur ingenti Crathis, qua cœrulus alveo,
Quaque etiam Syriis sylvæ convallibus horrent
Felices sylvæ, quarum de fronde liquescunt
Divini roris latices, quos sedula passim
Turba legit, gratum auxilium languentibus ægris.

Illic æstate in media, sub sole furenti
Dum regnat calor et terræ fiduntur hiantes

* * * * *

Cum nullæ spirant auræ, et silet humidus aer
Contrahitur paulatim, et lento humore coactus
In guttas abit, et foliis sitientibus hærens
Lentescit, rursumque diurno a sole recoctus
Induit et speciem ceræ, mellisque saporem.
Quodque et apes præstant arte, ingenitoque favore
Hoc medicos natura hominum producit in usus.

Pontani Opera, Venet. 1513, *Lib. Meteor.* p. 113.

† Vollaterranus (Raph.) *Comment. Urbann*, Paris, 1515, fol., lib. 38, f. 413. I have not been able to consult an earlier edition of his works, published, it is said, at Rome, in 1506.

The significance of this I take to be, that manna first began to be collected in Calabria, within the author's recollection, but that it was not considered so good as the Eastern manna.

It is to be observed that Saladinus, Pontano and Maffei all speak of manna as a production of Calabria, and it is evident, I think, that for a long time the drug was afforded by that region, and not by Sicily.

Brasavolus, of Ferrara, describing the drugs found in the shops *circa* A. D. 1537, mentions manna as a production of Calabria.*

Matthioli (1548) remarks that of manna he has only seen two sorts, the Levantine and the Calabrian.†

Alberti, in his *Descrittione di tutta Italia*, published at Bologna in 1550, mentions manna as found in Calabria.‡

Garcia d'Orta (1563)§ and Christopher Acosta (1574)|| describe different kinds of oriental manna, contrasting them with that of Calabria.

The *Ricettario Fiorentino* (edition of 1573) states that manna is of two kinds, namely, that of Syria, and that produced in the kingdom of Naples, especially about Cosenza in Calabria.

Still more significant is the fact that Fazelli, a well known writer on Sicily (1558), in a chapter on the productiveness of the island, boasts of its wine, oil, sugar, honey, fruits and saffron, but says not one word of manna, or the manna-ash.¶

The manna collected in these early times was undoubtedly that which the trees produced spontaneously, but it was neither abundant nor cheap.** That which exuded from the leaves was esteemed the best, and was called *manna di foglia* or *manna di fronda*; it is described as being in the form of solid, translucent,

* *Examen omnium simplicium*, Ludg. 1537, 8vo, p. 335.

† Comment. in Lib. I, Diosc. cap. 70.

‡ P. 198.

§ *Colloquios dos Simples*, etc., Goa, 1563, 4to, p. 132.

|| *Tractado de las Drogas y Medicinas de las Indias Orientales*, Burgos, 1578, 8vo, p. 399.

¶ *De Rebus Siculis*, Dec. I, lib. i, ch. 4. *De Ubertate Siliciæ*.

** Fiore de Cropani in his *Calabria Illustrata*, Napoli, 1691, says (p. 253) that the *manna di fronda* has been sometimes sold, even in Calabria, at 50 *scudi* for 6 ounces.

white grains, resembling little grains of mastich, and having a sweet and agreeable taste. The second sort was that which flowed spontaneously from the trunk and branches, and was termed *manna di corpo*; while the third or commonest kind was that picked up from the ground.

Towards the middle of the sixteenth century, it was found that a much more copious supply of manna could be obtained by notching the bark of the tree, and this new method of procuring the drug began to be adopted.* But the innovation did not pass unnoticed, for in the year 1562 Marino Spinelli, being *protomedico* of the kingdom of Naples, set about inquiring as to the article sold by the druggists as *Manna*: and as he doubtless found it no longer corresponded with that of former days, he declared, in concert with other learned physicians, that it was by no means good; and further to enforce his opinion, he procured the issuing of a public edict, prohibiting the druggists, under a severe penalty, from using any other manna than that of the leaf. This law proved very injurious to the Calabrians; it was felt, also, to be both severe and unjust by many of the physicians, one of whom, Annibal Briganti, took up the question in a philosophical spirit, made many visits to the manna districts, and investigated the differences alleged to exist between one sort of exudation and another. This resulted in the discovery that manna, whether spontaneously yielded by the leaves or stem, or obtained from the latter by aid of incisions, is essentially the same substance and possesses like virtues. These observations were recorded by Briganti in a long discourse written in Latin, for which, I am sorry to say, he has had very little credit—for not wholly trusting his own judgment on a subject so grave and controversial, he sent his MS. from Chieti, where he lived, to another learned man, Donatus Antonius ab Altomari, of Naples, who so entirely approved of it that he immediately published the whole of it in his own name!† Under the assumed authorship of Altomari,

*In Bauhin's edition of the commentaries of Matthioli, published at Basle in 1574, the practice of making incisions in the bark of the tree is distinctly alluded to, as being followed in Apulia and Calabria "*hac ætate*."

† "*Senza pure un minimo segno di gratitudine*." The account of this

we have then this essay as a quarto pamphlet of 46 pages, printed at Venice, in 1562, and entitled *De Mannæ differentiis ac viribus deque eas dignoscendi via ac ratione*: and, as if to give the work greater weight, it is in the form of an epistle addressed to Hieronimus Albertinus, Neapolitan prime minister of Philip II, a monarch whose connection with the English crown and Spanish armada has caused his name to be well remembered in our annals.

The custom of promoting the exudation of manna by wounding the stem and branches of the trees, must have occasioned a great increase in the production of the drug, a proof of which we have in the statement of Fiore (1691) that the sole district of Campana and Bocchiglioro affords annually 30,000 lb. with great profit to the gatherers, and 1100 ducats of excise to the government.* Of the period when the traffic in manna commenced in Sicily, I have no information. Paolo Boccone, of Palermo, mentions in his *Museo de Fisica e di Esperienze*, which appeared in 1697, several localities in Italy whence manna is obtained, adding that *manna forzata* (that from incisions being thus called) is also produced in Sicily.†

In conclusion, let me recapitulate the points in the history of manna, on which I have endeavored to throw light:

1. That the manna known in Europe in very early times was probably all of Oriental origin.

2. That manna of the ash (*Fraxinus Ornus* L.) began to be collected in Calabria in the first half of the fifteenth century.

3. That the practice of making incisions in the tree in order to promote the exudation, was not commenced until about the middle of the sixteenth century, previous to which period, the only manna obtained was that which exuded spontaneously.

4. That although the existence in Sicily of a mountain called by the Arabic name *Gibil-manna*, would seem to indicate that manna was collected during the period of Mussulman rule in

shameless piracy is related with much moderation by Briganti himself, in his Italian edition of Garcia d'Orta, published at Venice in 1582 (p. 50). Consult also Toppi, *Biblioteca Napolitana*, p. 20.

* *Della Calabria illustrata*, Nap. 1691—1743, fol. p. 253.

† Obs. xiv, xv.

that island (A. D. 827 to A. D. 1070), evidence has not been produced to prove the fact—but that on the contrary, it appears that manna was gathered in Calabria long anterior to its collection in Sicily.—*Lond. Pharm. Journ.*, Dec., 1869.

PHOSPHORIC PLASMA.

By R. ROTHER.

In tendering to pharmacutists the following suggestions for the convenient and practical production of this compound, the writer experienced some hesitation, cherished by slight misgivings as to its propriety in a scientific connection. * * * * Stability and facility are the two great distinguishing features that characterize this process, and its result. For the former we have nothing less than the inevitable and indispensable glycerin. For the latter we have the following:

Take of Phosphorus, one ounce.

Glycerin, 8 fluid ounces.

Starch, 4 “

Flour, 16 “

Water, 28 fluid “

Mix the glycerin, starch, and one pint of the water, in a capacious, cast-iron, enameled, evaporating dish, and heat the mixture, stirring constantly with a very flexible spatula until the plasma has formed; remove this from the fire, and stir, occasionally, until it is only warm, then add 8 fluid-ounces of the water, and the flour, and mix, thoroughly, by means of a stone-ware or wooden pestle, until a smooth, uniform mass is obtained. Take 2 ounces of this, add to it the remaining 4 fluid-ounces of water, and heat in a smaller evaporating dish, until sufficiently hot; add the phosphorus, in small portions at a time, and when this has entirely fused, stir with a flexible spatula, gradually adding some of the plasma, with constant stirring, and when of a proper consistence, incorporate it thoroughly with the remaining plasma. The writer now considers that pharmacutists see the point, and, consequently, abstains from giving any further illustrations.

Chicago, Dec. 21, 1869.

—*The Pharmacist*, Jan., 1870.

SOLUTION OF CITRATE OF MAGNESIA.

BY R. ROTHER.

In the above familiar title we behold the officinal synonym for magnesium citrate. That preparation, therapeutically so much esteemed, but pharmaceutically abhorred, which as viewed from the officinal stand-point, deservedly shares the aversion entertained by the pharmaceutical profession, whilst the opprobrium cast upon it is justly due to its inconstancy of composition and unstable character—results that are entirely attributable to the fallacy of the officinal edict.

Normal magnesium citrate ($\text{Mg}''_3 (\text{C}_6\text{H}_5\text{O}_7)_2$), when freshly prepared, is exceedingly soluble in water, but in moderately concentrated solution it rapidly undergoes a molecular change, and unites with seven atoms of water ($\text{Mg}''_3 (\text{C}_6\text{H}_5\text{O}_7)_2, 7 \text{OH}_2$). The insoluble combination thus produced is, consequently, thrown out of solution. But, in solutions similar to the officinal, owing to its moderate degree of dilution, this transformation is not instantaneous, but if once begun, rapidly progresses, until a limit is determined by the presence of the solvent; yet, only after the greater portion of the magnesium has been rendered insoluble and inert. The article is then, of course, in an unsaleable condition, and, not unfrequently, a serious loss to the conscientious pharmacist, whose integrity led him to misplace his confidence by a too strict adherence to the officinal code; but magnesium citrate, in this condition, is by no means a loss, since application of a gentle heat again restores its solubility. The solution, after being rebottled, possesses an indefinite permanence, altogether similar to the fresh preparation.

A moderate excess of acid is, also, of no avail, unless it be present in sufficient quantity to form the bimetallic salt ($\text{Mg}'' \text{C}_6\text{H}_6\text{O}_7$), which, however, is not the intent of the pharmacopœia, for, as in case of the officinal quantity, if the magnesium were reduced, and all the acid retained, an immoderate excess of this then virtually results, which would not fail to be therapeutically objectionable.

Knowing that the officinal formula is entirely unsatisfactory, it is not surprising to notice a rather strong disposition to dissent from it, and in the absence of a reliable guide, there is no-

thing more natural than that operators should follow their own inclinations in this respect. Hence, we see those who invariably adhere to the pharmacopœia, where such a possibility exists, prepare but a few bottles of it at a time, from day to day, as the demand requires. In this case the preparation is not finished until called for, when the final addition of the potassium carbonate is made. But this resort is very impractical, yet it is the only recourse for those who vow allegiance to the pharmacopœia. Others, out of ignorance, substitute magnesium carbonate for the oxide in the same quantity, and thus obtain a permanent solution of the bimetallic salt, with its excessive quantity of acid. Again, others see fit to reduce both acid and oxide, usually substituting carbonate for the latter, upon economical ground, although preserving the proportion of magnesium by the change. A solution about half the strength of the officinal keeps much better, in their experience.

Yet, by far, the greater number do not dispense magnesium citrate at all, but, under the pretence, and in bottles labelled magnesium citrate, variable solutions of sodium tartrate, or sodium citrate, either alone, a mixture of the two, or separately, but contaminated with insignificant admixtures of the corresponding magnesium salts, are largely thrown into market, and consumed with as much relish, and as, apparently, happy effects, as though it were the pure citrate.

Now, since the sodium tartrate and citrate are, therapeutically, similar to the corresponding magnesium salts, and in themselves stable preparations, and much cheaper products, there is no reason why they should not, officinally, replace, in whole or part, the pharmaceutically obnoxious magnesium compound. The universal desire is to obtain a permanent preparation that is, therapeutically, identical with the magnesium citrate, and can either replace, or pharmaceutically modify the latter.

We know that a solution about half the strength of the officinal is much more permanent, and that this permanence is rendered indefinite by a sufficient quantity of sodium citrate; and as sodium citrate is, therapeutically, identical with the former, and equally tasteless, there exists no just reason that can prevent an officinal substitution to be made.

For this purpose 40 grains of magnesium oxide, equal to 91 grains of the carbonate, are replaced by an equivalent quantity of either mono or disodium carbonate, which would be 168 grains of the former, or 286 grains of the latter, and substituting 182 grains (equivalent quantity) of magnesium carbonate for the remaining 80 grains of the oxide. We can construct the following formula, which contains the compound $Mg'' Na C_6 H_5 O_7$.

Take of

Citric acid, in coarse powder,	457½ grains.
Magnesium carbonate,	182 “
Monosodium carbonate,	168 “
or Disodium carbonate, crystallized,	286 “
Monopotassium carbonate,	40 “
Essence lemon,	a few minims.
Sugar, in coarse powder,	one and a half troyounces.
Water,	sufficient.

Dissolve the citric acid in six or seven fluid-ounces of water; to this add, gradually, the magnesium carbonate, first rubbed through a coarse sieve; when the solution is complete add, very gradually, the monosodium carbonate, or if the disodium carbonate is used, and in tolerably large crystals, the whole of this can be added at once, then, after effervescence has ceased, add the essence of lemon and the sugar; agitate until the latter is dissolved, filter and add sufficient water to the filtrate to make it measure 12 fluid-ounces; place this in a strong bottle of appropriate size; finally add the potassium carbonate, and cork securely.

In this formula magnesium carbonate is used, since it is of more uniform composition, much cheaper, and more convenient than the oxide. For various reasons crystallized disodium carbonate is preferable to the monosodic. It was also found equally convenient to employ sugar and essence lemon directly, rather than the syrup of citric acid. The formula when followed to the letter yields a very permanent preparation. But to attain indefinite permanence, and make surety doubly sure, the magnesium can be reduced one-half, and the sodium doubled.

CHICAGO, December 21, 1869.

—*Chicago Pharmacist*, Jan., 1870.

THE PURIFICATION OF BROMIDE OF POTASSIUM.

MM. Robière et Herbelin have been engaged in examining a number of samples of bromide of potassium for iodine. The test they employ is to place several fragments of the bromide, moistened with water, upon a piece of glazed paper, and expose to a trace of bromine vapor. If iodine be present, the paper acquires a blue tint. The bromine vapor is poured from a little flask filled with asbestos, wetted with bromine water. When the quantity of iodine is great, the blue tint may be partially or completely masked by the brown tint of free iodine. To avoid this, the test may be modified as follows. A crystal of the bromide is pulverized and put in a watch-glass standing on a plate. A few drops of bromine are poured on the plate and the whole covered with a glass. The bromide is unchanged, if it is pure; or if it takes a slight yellow tint, it loses it very rapidly in the air. If it contains a sensible quantity of iodine, it becomes immediately brown, the iodine being displaced by the vapor of bromine. If it contains only minute traces of iodine insufficient to give a visible coloration, the salt is transferred to a corked tube and agitated with benzol. The liquid immediately assumes a rose tint easy to recognize.

To purify bromide of potassium completely from iodine, the authors recommend to dissolve the salt in a small quantity of water, and then add, little by little, bromine water to the solution, heated to boiling, until it is present in excess. The liquid is then boiled and evaporated to dryness with constant stirring. The bromine is thereby perfectly deprived of iodine. It is then crystallized.

It has been since pointed out that, in the foregoing tests for detecting traces of iodine, the results may in every case be masked by the presence of any excess of free bromine. M. Duingt writes that if we introduce a little chloroform (or benzol or sulphide of carbon) into a solution of bromide of potassium containing $\frac{1}{1000}$ th part of iodide, and then add drop by drop, shaking after each addition, some dilute bromine water, we see the chloroform at first assume a violet tint, become decolorized by the next addition, and ultimately take a yellow color when

an excess has been employed. At this point, if the chloroformic liquid be decanted, and treated drop by drop with diluted sulphurous acid, it will reassume its violet color. He recommends, therefore, that in testing bromide of potassium, after agitating a solution of the suspected salt with chloroform and some drops of bromine water, if no violet color has been obtained, the chloroform should be separated and shaken with dilute sulphurous acid, added drop by drop, in order to restore the violet color of the iodine if it is present.—*C. H. Wood, F.C.S., in Pharm. Jour., London, Dec., 1869.*

THE POISONOUS ACTION OF PYROGALLIC ACID.

In a memoir on the use of turpentine as an antidote in phosphorus poisoning, M. J. Personne has expressed the opinion that phosphorus kills by absorbing the oxygen from the blood. Where the absorption of the poison is rapid, a true asphyxia is thus produced, which promptly causes death. According to this opinion, the turpentine acts by preventing the phosphorus from burning in the blood, in the same manner that it arrests its combustion at ordinary temperatures in the air. Being thus deprived of the power of removing the oxygen from the blood, the poison can be eliminated without causing any fatal derangement of the animal economy.

In order to test the accuracy of this doctrine, M. Personne has conducted some experiments with pyrogallie acid, a substance very different from phosphorus, but which resembles it in its power of absorbing oxygen very energetically, while in contact with an alkaline liquid. This acid was administered to two dogs; to one two grammes, and to the other four grammes were given in dilute solution.

All the symptoms of asphyxia were soon exhibited, and the animal manifested the same sufferings that result in cases of phosphorus poisoning. The animal which received the larger dose died at the expiration of fifty hours; the other ten hours later. The *post-mortem* indications were similar in all respects to those observable in cases of death from phosphorus.—*C. H. Wood, F.C.S., in Pharm. Jour., London, Dec., 1869.*

ON THE ESSENCE OF SASSAFRAS.

MM. Grimaux and Ruotte have made an investigation into the chemical constitution of the oil of sassafras. This oil is colorless when first rectified, and becomes yellow by exposure to air and light. Its density at zero is 1.0815. It rotates the plane of polarization to the right. It is a mixture of a dextrogyre hydrocarbon and an inactive oxygenized principle. It also contains a very small proportion of a body which appears to be a phenol, and has the power of reducing nitrate of silver at the boiling-point. This body is separated from the essence by agitation with solution of potash. It may be reprecipitated by hydrochloric acid in oily drops, presenting a strong odor of eugenic acid, and assuming a bright green color with ferric chloride.

The hydrocarbon saffrene contains $C_{10}H_{16}$. It boils between 155° and 157° C.; and possesses a density of 0.8345 at zero.

Nine-tenths of the essence distil over between 230° and 236° ; this portion is the oxygenated principle safrol, $C_{10}H_{10}O_2$. This body has not a rigorously constant boiling-point, because it resinifies slightly by the action of a high temperature. Safrol has a density of 1.1141 at zero, and remains liquid at -20° . It does not combine with the bisulphites. By the action of an excess of bromine it yields a solid crystalline pentabrominated derivative, $C_{10}H_5Br_5O_2$.—C. H. Wood, F.C.S., in *Pharm. Jour.*, London, Dec., 1869.

A TEST FOR ALCOHOL.

M. A. Lieben states that the following reaction affords the means of detecting small quantities of alcohol.

A small quantity of the suspected liquor is introduced into a test-tube with some grains of iodine and a few drops of caustic soda. The mixture is heated slightly, but without boiling; if alcohol is present, a yellowish crystalline precipitate of *iodoform* is deposited. He avers that $\frac{1}{2000}$ th of alcohol dissolved in water can be thus detected.

By applying this test to the examination of ether, M. Lieben has found that it is very difficult to remove the last traces of alcohol from that substance by washing with water. To avoid so many washings he thinks it better to submit the ether to an oxi-

dizing mixture of bichromate of potash and sulphuric acid; then to remove the products of the oxidation of the alcohol by washing once or twice with water.

M. Lieben has also applied his reaction to the examination of urine after drinking alcoholic liquids. He can always detect alcohol in the first portions of the distillate.—*C. H. Wood, F.C.S., in Pharm. Jour., London, Dec., 1869.*

GLYCERATUS.—A SUBSTITUTE FOR SIMPLE SYRUP.

BY H. TREVERTON BOND.

Allow me to suggest the following preparation, which I have christened "Glyceratus," as an article that in many prescriptions can be used with advantage in place of simple syrup.

Take of Glycerin,	one pint,
Water,	two pints.

Mix them.

The objections to simple syrup are too well known to need mention, while the great solvent power of glycerin (see U. S. Dispensatory, p. 419,) render it far superior in many instances. This preparation undergoes no change, and can be readily made.

If the syrup in various ferrated elixirs be replaced by "Glyceratus," the tendency to change either by precipitation or darkening will be found to be entirely obviated, or to exist in but a very slight degree.

Wheeling, West Virginia, Feb. 14th, 1870.

PREPARATION OF HYDRATE OF CHLORAL.

BY M. STADELER.

Liebig prepares chloral by passing dry chlorine into absolute alcohol, and gradually increasing the heat until chlorine ceases to be absorbed. 8 oz. alcohol require a rapid and continuous current for at least twelve hours. The residue, which generally crystallizes, is agitated and gently heated, with twice or three times its volume of concentrated sulphuric acid; the crude chloral is separated, and by boiling for some time and by rectification over lime it is freed from alcohol and muriatic acid, the distillation being stopped when the liquid no longer covers the lime.

Chloral is an oily, colorless liquid, of a penetrating odor, and somewhat biting taste; it boils at 94° C. without decomposition. Mixed with little water, heat is evolved and hydrate of chloral produced, forming a colorless mass consisting of acicular crystals; these crystals are soluble in water; the solution possesses odor and taste of chloral, and on evaporation over sulphuric acid yields large rhombic crystals of hydrate. Heated with alkalis it is decomposed into chloroform, metallic chloride and formiate of alkali.

Städeler's method is as follows: 7 parts of muriatic acid are gently heated with 1 part starch until the paste is converted into a liquid; 3 parts black manganese and a little table salt are then added; the mixture is rapidly heated to boiling when the fire is at once removed. The mass foams considerably, giving off carbonic acid and continuing to boil for some time. After boiling ceases, heat is again applied until the distillate ceases to be rendered turbid by strong potash lye. The oily drops floating upon the surface are carefully removed, the liquid is saturated with table salt and distilled, the distillate being again carefully freed from an odorous sulphur yellow oil. The distillation over table salt is repeated several times, to obtain a concentrated aqueous solution of chloral, which is saturated with chloride of calcium and rectified from an oil bath, when the hydrate distils as a colorless liquid which soon congeals. On mixing the hydrate with four times its volume of sulphuric acid, chloral is separated as a colorless liquid, which is freed from muriatic acid by slow boiling. This purified chloral, mixed with water, yields pure hydrate of chloral.—*Zeitschr. d. oesterr. Apoth. Ver.* 1869, 524.

BALATA.

By A. SPERLICH.

For some years past an article has been met with in commerce under the name of balata, which has properties intermediate between caoutchouc and gutta percha, and is used for similar purposes. Balata is prepared from the milky juice of the bully tree, *Sapota Muelleri*, *Sapotaceæ*, which is indigenous to Guyana, the product being exported to Europe mainly from Berbice.

Balata contains only few per cent. of oxygen, and therefore was supposed to be mainly a carbohydrogen, mixed with an oxygenated body. Cut into small pieces, crude balata was boiled with slightly acidulated water, which removed a small quantity of a yellowish brown coloring matter. The residue dried yielded to boiling absolute alcohol a colorless resin. The undissolved portion after drying was digested with bisulphide of carbon, and gradually dissolved to a colorless liquid, leaving a little of a brown ligneous body behind. The white transparent film left on distilling the bisulphide of carbon was repeatedly boiled with spirit of ether, then dried and analyzed; it contains 88·49 carbon and 11·37 hydrogen, nearly the same figures which Adriani obtained for pure gutta percha.

In the dried milky juice of the bully tree, the author found 81·31 carbon and 10·17 hydrogen; the balance is ascribed to oxygen.—*Zeitschr. d. allg. oesterr. Apoth. Ver.*, 1869, 525, from *Sitzungsber. d. Kais. Akad. d. Wiss.*, lix.

Editorial Department.

CASE OF ALLEGED ACONITE POISONING IN SAN FRANCISCO.—Several pharmacutists having forwarded to the Editor copies of newspaper articles in which the circumstances surrounding a case of alleged poisoning are stated pro and con, we are at a loss to decide whether it should be noticed at all at this late period; nevertheless, after a careful weighing of the evidence as therein produced by both the coroner and the druggists, we believe the cause of truth may be served by giving a brief account of the case.

On the morning of Sunday, Dec. 12th, 1869, George Murray Thompson, a young lawyer of San Francisco, met his physician, Dr. Bates, on the street, and they went together to the lawyer's office at his request, and the physician finding him nervous, with symptoms tending toward *mania a potu*, gave him the following prescription:

“R. Tincturæ Lupulinæ.

Extracti Valerianæ Fluidi,	aa f ʒj,
Extracti Scutellariæ Fluidi,	f ʒss,
Aquæ Camphoræ,	f ʒiss,
Sacchari,	ʒss. M.

Sig.—Dose, a tablespoonful every three hours, to produce sleep. Dr. Bates.”

Mr. Thompson decided not to use the prescription until evening, accepted an invitation to dine at Mr. Carr's, and afterwards accompanied a lady to church, returning at 9 o'clock, P.M., when he went to Mr. Burnett's drug store and had it compounded by William P. Hedges, his chief clerk. In about half an hour he returned, saying the medicine was too strong for him, and desired to be relieved by a stomach pump. Dr. Quinlan happening to be present, and being made acquainted with the prescription, advised Thompson to go home, he would soon be better. Dr. Q. accompanied him to a hotel, where he was seized with spasm, and the clerk refused him a room. Dr. Q. then sought a carriage, but returned without one, found the patient "twisting and turning" with pain, and gave him brandy, which was instantly rejected. He died about 11 o'clock, previously suffering intense pain. Dr. Q. thought the cause of death was "cerebral difficulty caused by liquor." The bottle containing the remainder of the medicine was taken from the pocket of the deceased and sealed up, at Dr. Q.'s request, at the hotel.

The Coroner, Dr. Letterman, states that the bottle was received, with the body, by his clerk, that it was two-thirds full, and that it was not opened until, before leaving it for the chemist, Mr. Howden, at Wakelee's drug store, he opened it there in the presence of four witnesses, who each tasted its contents, and, from its physiological effects, were each satisfied that aconite was in it, and then resealed the bottle. Mr. Howden is the chemist at Wakelee's laboratory, and is employed by the coroner.

Mr. Howden stated in substance that he had received the stomach in a jar, and the bottle of medicine, sealed; one-half of the latter, in the original bottle, was returned to the Coroner. The contents of the stomach, amounting to five ounces, were turned into a porcelain dish, and the organ itself well washed into the dish with twelve ounces of alcohol, containing some acetic acid. They were digested for two hours with occasional stirring, filtered, the filtrate evaporated on a water bath nearly to dryness, the residue treated with water, filtered and evaporated carefully to a drachm, ammonia added in excess, and the mixture treated with repeated portions of ether, decanting the ether each time. The ethereal liquid was then evaporated to dryness, and the residue contained aconitia, and had the peculiar effect of aconite when tasted. One-thirtieth of a grain of it killed a kitten in twelve minutes. The mixture in the bottle was treated in the same way, and gave a similar result. The inference was therefore strong that the contents of the bottle had caused death.

We have nowhere seen a copy of the verdict of the coroner's jury, but from the published proceedings of the meeting of the California Pharmaceutical Society it may be inferred that it was to the effect that George Murray Thompson came to his death from the effects of aconite, put in a mixture by mistake on the part of the clerk, Mr. Hedges.

The meeting above referred to met on the 27th of December, and its object was "to investigate the charges preferred against one of its mem-

bers by the recent action of the coroner's jury in their verdict as to the cause of the death of George Murray Thompson." Mr. Burnett was called upon to state the case, which he did much as in the fore part of this notice, and then testified to the careful habits of and his entire confidence in Mr. Hedges. Dr. Bates stated that he had prescribed for Mr. Thompson as a case of incipient *mania a potu*. Dr. Quinlan stated that when he first saw Thompson his pulse was 100, that he considered him suffering from *delirium tremens*, and that he died of *the same*. He did not believe that aconite could be found in the medicine, and offered to wager \$500 that no chemist can extract aconite from a mixture. He reflected strongly on the coroner, charging him with malpractice, and blamed the chemist for not reserving a portion of the stomach and contents.

Dr. Grey had seen two deaths from aconite, and in both cases the pulse became almost imperceptible before death.

Prof. Price said that a chemist could separate aconite from anything admixed with it, but afterwards he could only recognize and identify it by its effects physiologically.

Mr. Burnett asked why the chemist looked for aconite instead of morphine, and said he should not be blamed for the contents of that bottle after it had been in Wakelee's drug store, and thought it preposterous, at the same time disclaiming any intimation that Wakelee had tampered with it, though he was positive some one had.

After some further discussion, the Society passed the following resolutions :

"*Resolved*, That after due investigation as to the matter of the death of George Murray Thompson, this Society believes that his death was not the result of a mistake in compounding the prescription, as alleged by the coroner's jury.

"*Resolved*, That we deprecate the action of the coroner in accepting unsworn testimony before an unscientific jury, without giving the apothecary, who was indirectly implicated as having caused the death, an opportunity of shaking the evidence by cross-examination or counter-testimony."

In reviewing the evidence and facts as stated, and assuming that Mr. Hedges was innocent of a mistake (and that is the ground taken by the Pharmaceutical Society), it would have been right to have sought in the mixture for all the ingredients proper to it. If they were all there,—and all but the scullcap could be readily detected by sight, taste and smell,—the inference would have been powerfully in favor of the innocence of Mr. Hedges, and of the introduction of the poison in some other way. But if it had been proved that the lupulin, the valerian, or even the scullcap, was *not* present, it would have been a strong evidence that Mr. Hedges had inadvertently substituted aconite for the missing ingredient. In his evidence before the coroner, Mr. Hedges testified "that the prescription was composed entirely of vegetable productions," and was not questioned as to what he did put in; nor was Mr. Hedges in evidence

before the Pharmaceutical Society when the matter was investigated. Some may consider it strong presumptive evidence of innocence on the part of Mr. H. that he did not himself doubt his having dispensed the prescription correctly so far as to examine the medicine by taste and smell, but in our opinion *he should have done so in any case*, if only to convince the patient that he was sure all was right. If he had done so in this instance he would instantly have detected the aconite, and the life of Mr. Thompson might in all probability have been saved by emetics, or, as he had asked, by the pump and auxiliary treatment, a physician being on the spot. After nearly forty years' experience at the dispensing counter, we are more and more impressed with the truth that the price of safety in dispensing is unceasing vigilance on the part of the dispenser, and that none of us are invulnerable to a mis-step.

As regards the testimony of the principal medical witness, we are not surprised that it should be set aside by the Coroner's Jury in their verdict. He was with the patient at the drug store, where he could have examined the medicine and got at the truth; but it does not appear that he did so, or that he even suspected the probability of an error, and the man died in his presence without an effort to save him, although the sufferer had pointed out the way in a manner calculated to arouse his suspicion of poison. His wager, that no chemist could extract aconite from a mixture, was in character. It is an unjust reflection on chemistry, and is untrue. Aconitia can also be detected by tests, which, though applicable to some other bodies, are, when taken in connection with the physiological test, strongly characteristic and not to be set aside.

As regards the action of the Society in the premises the testimony was all on one side, and the resolutions naturally flow from the testimony. If the meeting was called to protect a fellow-member from the imputative action of a coroner's jury it was in character; but if it was intended to investigate the truth of the verdict (and this should have been its object) it seems to be proper that the testimony should have included that of Mr. Hedges, the only person beside the chemist who could be expected to know what was in the mixture.

We cannot let this matter pass without saying that it is no part of a coroner's jury to condemn or defend an individual situated as Mr. Hedges, but only to endeavor to get at the true cause of death.

THE LIST OF MEMBERS AND GRADUATES OF THE PHILADELPHIA COLLEGE OF PHARMACY, printed in the pamphlet accompanying the January number, has been found to be imperfect, several names having been accidentally omitted. This is greatly regretted by the Committee having the matter in charge, especially as several prominent early members are among the omissions. The Editor has been requested to state that a thorough revision of the records of the College will be made as early as practicable, and a revised list published.

THE SALE OF ALCOHOL BY APOTHECARIES.—Cannot something be done to relieve apothecaries from the necessity of taking out a liquor license in order to sell alcohol for the numerous proper and useful purposes to which it is applied wholly unconnected with its use as an ingredient in beverages? According to the ruling of J. W. Douglass, Acting Commissioner, in November last, “druggists and apothecaries cannot sell alcohol in quantities exceeding half a pint at one time, nor can their sales of alcohol, including their sales of other spirits, exceed in aggregate cost value the sum of \$300 per annum, without liability to payment of a special tax as liquor dealer.” According to the letter of this rule an apothecary *may* sell any official liquor in quantity not exceeding half a pint, and in annual value not exceeding 300 dollars. According to another ruling, potable liquors can only be sold by the apothecary when prescribed by a physician, unless he has a license. Which is true?—The law certainly should leave the apothecary sufficiently untrammelled to serve the proper need of the sick.

THE ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—The attention of those of our readers who are interested is requested to the following:

The second annual reunion of the Alumni Association of the Philadelphia College of Pharmacy will be held on Monday evening, March 21st, 1870. A cordial invitation is extended to members throughout the country. Those desiring to attend will please notify the Secretary at once.

Any communications intended for that occasion must be sent to

CLEMONS PARRISH, Secretary,
800 Arch St., Philadelphia.

SCHOOL OF PHARMACY. ANNUAL COMMENCEMENT.—The lectures having closed and the examinations in progress, it may be stated that the commencement ceremonies will be held in the Academy of Music, on the evening of March 22d. The Valedictory by Prof. Bridges.

Proceedings of the American Pharmaceutical Association at the Seventeenth Annual Meeting, held in Chicago, Ill., Sept. 1869; also the Constitution and Roll of Members. Philad., Merrihew & Son, 1870: pp. 468 octavo.

“The Proceedings” came to hand about the second week in February, and in the execution of the volume as regards printing, paper and binding, are creditable to those concerned in getting it out. The preliminary portion, or minutes of the meeting, which embodies nearly the whole of the phonographic report of Mr. Slade, is full of interest, and will supply those who did not attend the meeting with a full and connected account of it. Mr. Slade is a most excellent reporter. The Report on the Progress of Pharmacy, by Dr. Frederick Hoffmann, of New York, is an elaborate work of 161 pages, full of interesting details of great value

to those seeking hints as to what has been done for pharmacy during the previous year, and where to find it. We have no space to enlarge on it, but must approve of the fullness given to it, which enables the reader to form, in many instances, a fair idea of the papers alluded to. We consider it highly creditable to the ability and perseverance of Dr. Hoffmann, and we think his name might well have been appended to it by the Editor, as is usual with such reports, as the modesty of the author nowhere makes his name appear.

The Report on Specimens, by Mr. T. Whitfield, is an enumeration of the specimens on exhibition. The Committee does not attempt an analysis of the merit of the exhibition, being prevented by the brevity of the period at their command for examination, and they suggest that in future occasions of the kind, the Association should devote the time of one session solely to the personal examination of the articles exhibited, to prevent absence from the meeting for that purpose as well as to do justice to the exhibitors, who go to great trouble and expense to make their contributions.

The Report on the Pharmacopœia, by Dr. E. R. Squibb, occupies fifty printed pages. It is an individual report, for which the reporter only is responsible, and has been a work of much labor, based on the constantly recorded observations of the author during the past ten years. The remarks on the preliminary notices embrace many useful hints for the coming revision. The metrical system of weights is advocated, as is the abandonment of measures of capacity. The manipulation of percolation has to be so modified to meet the physical condition of drugs in relation to solvents that the reporter doubts the propriety of directions for universal application, and that each preparation should be specially explained in this regard. In commenting on the *Materia Medica* the report makes the most sweeping recommendations of dismissal, which include 57 articles in the primary list and 70 in the secondary. We consider the reporter occupies the wrong standpoint to judge of what should constitute the *Materia Medica* list for a population and a medical profession embracing so many nationalities; not to speak of that numerous body called country practitioners, who often set great value on indigenous remedies. That which will suit the circumscribed condition of the army and navy is wholly unsuited to meet the daily wants of a pharmacy whose prescriptions take a wide range. We therefore think the Association very properly disclaimed an approval of this part of the report. The reporter's comments on the processes of the Pharmacopœia possess many valuable hints, the result of careful study, and which deserve careful notice by the forthcoming Revisional Committee, yet there are not a few suggestions that will not be approved of by many.

Mr. Faber's report of the doings of the International Pharmaceutical Congress, at Vienna, is full and interesting. In regard to the Special and Volunteer Reports, we believe they are neither so numerous nor so

valuable as in some former years. Quite a number of them have been reprinted in this Journal, and will speak for themselves.

We cannot leave this notice without expressing our regret at the prospective resignation of Prof. J. M. Maisch as Permanent Secretary. The qualification for the post is not easily met with, and even the best have to serve an apprenticeship of years to become familiar with the routine of the service. We hope that Prof. M. will be persuaded to withdraw his resignation and that some part of his duties will be laid on other shoulders.

Proceedings of the American Philosophical Society. Vol. XI, No. 82.

This number extends from June 18th, 1869, to Dec. 17th, 1869, and embraces a number of interesting papers on natural history, astronomy, geology, meteorology, Indian relics, etc., but the paper most interesting to pharmaceutical readers is that of Prof. H. C. Wood, Jr., "*On the medicinal activity of the Hemp Plant as grown in North America*," a prize essay read before the Society Nov. 19th, 1869. It has been considered that the peculiar resin of the tops and leaves of *Cannabis sativa*, so much esteemed in medicine, is only developed in quantity in the warmer countries of Asia. In fact an experiment made by us a few years since on hemp leaves grown in Philadelphia proved them to contain but little resinous matter. Dr. Wood, however, obtained "male plants grown for the purpose of fertilizing seeding female plants, and which, having fulfilled that office, were of no further value to the cultivator," being furnished by R. B. Hamilton, Esq., of Lexington, Ky. Dr. Wood treated half an ounce of the powdered leaves with alcohol, and by evaporation obtained an extract. He took between 20 and 30 grains of this extract at a dose, which, after several hours, produced the effects characteristic of the Indian hemp in such a forcible manner that it should be called poisoning, commencing with a joyous elevation of spirits and passing into other and alarming symptoms, the most distressing of which was a feeling of impending death, &c., &c. The physiological details reported by the author and his friend, Dr. Thomas, who attended him during the paroxysms, are sufficiently interesting, but the space at command here is so brief that we must pass them by to state that subsequent pharmaceutical trial with the Kentucky hemp tops and leaves afforded four or five per cent. of resin deprived of extractive by means of carbonate of soda. This was tried and found active in three-fourths of a grain. Subsequently Messrs. Hance Brothers & White prepared some of the resin after the manner of Messrs. T. & H. Smith, of Edinburg, which in one-fourth gr. doses produced decided therapeutic effects. Dr. Wood infers from his results that the male hemp plants of Kentucky are capable of replacing the East Indian drng, and that the hemp resin only should be recognized by the Pharmacopœia, prepared by a method analogous to that of the Messrs. Smith, of Edinburgh. It is a matter of much interest to have the pharmaceutical part of the subject fully investigated by a

competent pharmaceutical chemist on the spot, as to the proportion and quality the resin afforded by the male and female hemp plants to the Kentucky and Missouri hemp regions. If Mr. Lewis Diehl, of Louisville, Ky., would undertake this and report his results to the Association next September, he would greatly aid in getting a solution of the question, whether the development of hemp resin is influenced by the gender of the plant, or whether it is soil, climate, or other circumstances. We may state that the hemp tops and leaves of our experiment (see Amer. Jour. Pharm., 1865, p. 23) above alluded to, were collected in August, 1864, from seed-bearing plants six feet high, grown near Coates and Broad Streets, in Philadelphia. Dr. Wood, alluding to the supply for pharmacutists, says, "the male seeding plants in Kentucky, after they have shed their pollen, are worthless. It was with such plants the experiments were instituted. A considerable supply of them might be obtained, so Mr. Hamilton writes me, for little more than the expense of gathering them, or if the demand should exceed the amount of such male plants the leaves of the female plants when ready to cut for the fibre might be obtained on the same terms.

The Cell Doctrine : its history and present state. For the use of students in medicine and dentistry. Also a copious biography of the subject. By James Tyson, M.D., Lecturer on Microscopy in the University of Pennsylvania, &c., &c. With a colored plate and other illustrations. Philad. : Lindsay & Blakiston, 1870. Pp. 150, 12mo.

This volume has been the result of much research into the literature of the subject, guided by an earnest desire on the part of the author to present the fruits of his labor in a form adapted to greatly aid the student of physiology and pathology "He has sought to obtain a continuous history of the 'cell doctrine' up to its present state, without embarrassing his pages with a large number of isolated facts. He has attempted, however, to secure a completeness, and to make the work useful to physicians and others engaged in research by careful references and the addition of a bibliography which he has sought to make accurate and extended."

A glance over the work will convince the reader that the author has fulfilled his prefatory promise, and has produced a condensed historical account of the early and later observations and speculations or theories which have marked the gradual development of the present idea of the growth of organic bodies from cell nucleoli, as exposed by the microscope. It is curious to follow the chain from Galen to Schleiden and Schwann, and from these to the present time, when the more perfect views of Huxley, Virchow and Beale prevail among physiologists. The book is beautifully printed on excellent paper, is neatly bound, and reflects credit on all concerned. Price, two dollars.

Chemistry : General, Medical and Pharmaceutical, including the Chemistry of the British Pharmacopœia. By John Attfield, Ph.D., F.C.S.,

Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, &c., &c. London: John Van Voorst, 1869. Pp. 624, 12mo.

In March, 1867, the first edition of this work was noticed under its name, "An Introduction to Pharmaceutical Chemistry," in 446 pages, and the reader is referred to that notice for the general character of the present volume. It speaks well for this "Chemistry" that a second edition has been so soon demanded, and the fact that its size has increased from 446 to 624 pages assures us that this is not a mere reprint of the first edition. Little is to be learned from the author's preface of the changes or additions, but in looking the work through the reader will find that many parts are re-written, others extended by addition, and in a few instances mere notices have been expanded into chapters, as, for instance, the fatty oils, the resins, and the coloring principles. The chapters on alkaloids and glucosides have been much improved, as has that on the alcohols. The chapter on weights and measures and specific gravity has been increased, and the metric weights strongly urged for general use. The chapters on volumetric and gravimetric analysis are less changed than the other parts, but the appendix of tables has been extended from eight to twenty-three pages, including many of great use in practice.

Another feature of this edition is that the "questions and exercises" are placed immediately after the chapters to which they refer, instead of all together in the Appendix,—a change for the better which the teacher and student will appreciate. On the whole, it may truthfully be said of this edition that Dr. Attfield has increased its scientific accuracy, extended its scope, and improved its adaptation as a manual of practical chemistry for pharmaceutical and medical laboratory students.

Proceedings of the First Annual Meeting of the California Pharmaceutical Society, held at San Francisco, Oct. 11th, 1869; also the Constitution and roll of members. San Francisco, 1869; pp. 27, octavo.

This pamphlet presents a creditable exposé of the doings of this new Society at the first general meeting after its organization. The chief part is occupied by a report of the Executive Committee, consisting of Messrs. Calvert, McBayle, Burnett, Miller and Steele, from which we learn that the number of dispensing drug stores in San Francisco city and county is eighty-eight, and wholesale stores five; that the importation of *foreign drugs* for the year ending October, 1869, was about a million of dollars. The following extract from a communication to the Society from Dr. Wooster, U. S. Drug Examiner, suggests a new topic: "The Chinese import a large amount of simples, and they are much better packed than similar articles coming from Europe. It occurs to me that if a committee of American druggists should examine Chinese importations, they would find many articles which could be imported from China at a better margin of profit than from Europe."

The Flora of California is interestingly noticed. More than eighty botanists have visited California between 1792 and 1865. More than 1800 species have been found, more than fifty of which are forest trees, and many others medicinal and deserving of analytical investigation. The report speaks of the growing evils from excessive competition in trade, and of the necessity of more care in the sale of poisons. The establishment of a school of pharmacy is advocated. Suggestions relative to the revision of the Pharmacopœia occupy a part of the report, advocating the idea of remembering California in the adaptation of the materia medica and preparations to the wants of the United States; and suggest a list of preparations needing revision. The reporters also suggest that a fusion of the United States and British Pharmacopœias would be an advantage,—a suggestion made (we believe) without due consideration of the premises involved, and which would certainly not improve our own code in the direction of American ideas of pharmaceutical reform.

The metrical system of weights and measures is advocated, a more decided attention to preliminary education in the choice of apprentices urged, and a peroration tending to stimulate liberal views, and to suppress rivalry and jealousy in business. There is also appended to the report a list of queries to be reported on at the next meeting (in the manner of the Association), which may call forth much useful information. So good a beginning deserves the encouragement of all well-wishers of pharmacy, and our mite is fully and cordially extended. The Society is composed of ninety-four members and four honorary members. All but eleven of the present list of members are in San Francisco.

On the effects of Opium and its derivative Alkaloids, by S. Wier Mitchell, M.D. Published in the American Journal of the medical sciences for January, 1870; pp. 16.

This paper, originally read before the Academy of Natural Sciences, is devoted to the study of the physical action of the opium alkaloids on birds, more especially on pigeons, ducks and chickens, describing a large number of experiments on these animals with some remarkable results, which may be summed up in the following conclusions, for which only we have space, viz.:

1. "Birds: namely, ducks, chickens and pigeons are never poisoned by crude opium, its extract, or acetum opii (black drop) given internally; whilst the salts of morphia must be given in enormous doses to produce fatal effects when administered in the same manner.

2. *Morphia* salts, used hypodermically in excessive amounts, never cause sleep or stupor, but act as excitants (convulsants) upon the motor centres. In some instances the spasms are tetanoid in character; but in the duck they approach nearest to the typical strychnic spasm.

3. *Thebaïa* is a tetanizing agent, only inferior in energy to strychnia and brucia.

Narcotina, almost inert in man, destroys birds when employed hypodermically, in doses of from 2 to 7 grains.

Codeia is a fatal convulsing agent in birds (pigeons).

Meconin causes emesis when given internally, and is harmless placed under the skin.

Narcein has no perceptible influence except to disturb slightly the respiratory functions.

Cryptopia in doses from a fifth to half a grain, no effect.

None of the agents cause sleep in the pigeon, duck or chicken."

That narcotina should be a bird poison is a remarkable new fact developed in these researches. The whole paper is full of interest, and is readily accessible in the journal above quoted.

On the physiological action of the alkaloids Viridia, Veratroidia and Resin of Veratrum Viride, and of the Veratria of commerce. By Horatio C. Wood, Jr., M.D., &c. Published in the American Journal of the Medical Sciences for January, 1870; pp. 18

It will be remembered by our readers that the paper of Charles Bullock, published in the 37th volume, 1865, page 321, of this journal, and continued in the 38th volume, 1866, page 97, announced the isolation of two distinct alkaloids in veratrum viride, (which, by the by, Dr. H. C. Wood has incorrectly attributed to the Proceedings of the American Pharmaceutical Association.) These alkaloids have been named *viridia* and *veratroidia* by Dr. G. B. Wood, in the 13th edition of the United States Dispensatory, now about issuing from the press, and Dr. H. C. Wood has undertaken the study of them in the paper above announced. The results are summed up as follows:—

1. "*Viridia* appears to be but slightly, if at all, locally irritant.
2. It has no action whatever upon the alimentary canal; never producing either vomiting or purging.
3. It exerts no direct influence upon the brain, and the pupil is not affected by it, except it be an indirect dilatation of it before death.
4. It is a spinal motor depressant (probably directly so) producing death by paralysis of the respiratory nerve centres, and is without action on the muscles or nerves.
5. It is a direct depressant to the circulation, lowering the force and rapidity of the blood streams, slowing the action of the heart, and finally affecting the force of the single beat independent of any spinal action it may exert.

Veratroidia appears to be physiologically as well as chemically, in many respects, midway between *viridia* and *veratria*. Its influence is:—

1. Locally it is somewhat irritant.
2. It is an irritant emetic and sometimes cathartic.
3. It exerts no direct influence upon the brain or upon the pupil.
4. It is a direct spinal motor depressant, producing death by asphyxia,

and acting at the same time, to some extent, upon the conducting nerves and muscles.

5. It depresses the heart's action, both in force and frequency, but the period of depression is followed by one of reaction, its primary cardiac action being independent of its spinal influences."

Dr. Wood corroborates the statement of Charles Bullock, that the purified resin of *veratrum viride* has no influence on the circulation, and is probably inert.

The Half-Yearly Abstract of the Medical Sciences, being a digest of British and Continental medicine, and the progress of medicine and the collateral sciences. Edited by William Domett Stone, M.D., F.R.C.S. Vol. L. Jan., 1870. Philada.: H. C. Lea; pp. 296. Price \$2.50 per annum; single volumes, \$1.50.

This volume comes freighted with the usual amount of interesting observations, and among them we notice articles on chloral from Lieberich, Demarquay, Richardson, Dreulafoy and Krishaler.

The Chemists' and Druggists' Almanac and Pharmaceutical Text Book. 1870. London: "Chemist and Druggist" office, Colonial Buildings, Connar St., E. C.

This well gotten up "almanac" is received from the publishers of the *Chemist and Druggist*, London. It contains over 100 pages, 12mo., and is neatly bound in cloth and full of information, legal and professional, including many formulæ, a botanical calendar, and various tables. Though much of the legal information bearing on pharmacutists applies wholly to England, there is much of a general character useful everywhere.

Braithwaite's Retrospect of Practical Medicine and Surgery. A half-yearly journal, part LX., uniform American edition. New York: Townsend & Adams, 1870; pp. 329, octavo.

This established semi-annual comes as usual full of valuable articles. Among them we notice Dr. Sansom's paper on the therapeutic properties of the *sulpho carbolates*. Dr. Fenwick's paper on calabar bean in tetanus, and Dr. Gee's paper on the physiological effects of *apomorphia* and *chlorocodide*, derivative products from *morphia* and *codeia*, by heating them in hydrochloric acid in sealed tubes.

The European Mail, a full and complete summary of home and foreign news for the United States, Canadian Dominion, &c., &c., &c. Published weekly for dispatch by the mail steamers; pp. 28, folio.

This valuable and comprehensive weekly is priced at 13 shillings sterling, with 4s 4d postage; making about five dollars subscription, post-paid.

Bowdoin Scientific Review, a fortnightly journal. No. 1, vol. 1, Feb. 15, 1870. Brunswick, Maine ; pp. 16.

This new journal is edited by Professors Brackett and Goodale of Bowdoin College, and embraces several notices of valuable papers, among which that of Dr. Wier Mitchell, on the opium alkaloids, is included.

The Manufacturer and Builder for January and February is received.

Each number contains 32 large quarto pages, issued monthly, containing many illustrations. Published by Western & Co., 37 Park Row, New York.

THE NEW JERSEY PHARMACEUTICAL ASSOCIATION.—Just as we are closing our columns we are informed by Prof. J. M. Maisch that, at a meeting held at Newark, N. J., on the 17th and 24th of Feb., this new body was instituted, and Charles H. Dalrymple, of Morristown, elected President.

OBITUARY.

ARTHUR WELLESLEY GABAUDAN, of New York, died on the 4th of January last, at the age of 57. He was a well known and able pharmacist, was a member of the American Pharmaceutical Association, and a Vice President of the College of Pharmacy of the City of New York.

Mr. Gabaudan was born at Pleasant Valley, Dutchess Co., New York, on the 7th of January, 1814. His father, a native of Jamaica, was of Huguenot extraction, originally from Normandie. He studied both pharmacy and medicine, but at the age of 24 devoted himself exclusively to the former profession, of which he became an eminent member. Mr. Gabaudan leaves a wife and two daughters; but probably no other circumstances than the above are of general interest. Yet to his friends other impressive recollections do occur, and although Mr. G. became prosperous during later years, he formerly met with adversity in business not easily overcome. Within a short period he lost his only remaining son, and his own death renders the family name extinct.

The following resolutions were passed by the Board of Trustees of the New York College of Pharmacy on the 6th of January :

"Whereas, In the death of ARTHUR W. GABAUDAN the College sustains the loss of a valued officer, and the members of this Board an esteemed associate ;

"Be it resolved, As a demonstration of respect, that the Trustees attend the funeral of the deceased, and invite the attendance of the Professors and members of the College ;

"That the Secretary be requested to transmit to the family of Mr. Gabaudan a letter of sympathy in its great affliction ;

"That an obituary *in memoriam* of Mr. Gabaudan be published in the next issues of the *Druggists' Circular* and the *American Journal of Pharmacy*, and that the Secretary enter these proceedings on the minutes of the Board."

STEPHANE ROBINET, pharmacien, of Paris, died on the of December, in the seventy-fourth year of his age. He was born at Paris, on the 6th of December, 1796. He commenced his education in that city, but was afterwards sent by his parents to Germany, where he became master of the German language. Subsequently he applied himself to the study of pharmacy. He was a pupil of Pelletier, and afterwards of Vauquelin, in whose laboratory he finished his studies in 1814, and after his examination opened a shop in Paris, which he subsequently abandoned to devote himself entirely to science.

M. Robinet was the author of numerous papers relating to pharmacy in earlier life, and of several translations from the German. He was one of the founders of the *Journal de Chimie Medicale, de Pharmacie et de Toxicologie*, now in its 46th year. After 1836 he devoted much time to agriculture, and especially to sericulture, in its relations to science, in which he appears to have been very useful to the silk growers.

M. Robinet was an officer of the *Legion d'honneur*, a member of the Imperial Academy of Medicine, and of the Société de Pharmacie, of which he was one of the most eminent members, and of various other French and foreign learned societies. The latter part of his life, when not occupied in public matters, he devoted to the study of the waters of France, and has left an unfinished work on this subject.

As a pharmacist Robinet was an uncompromising enemy of empiricism; he believed that pharmacy should be practised only by those who had bought the right by primary education, examination and the diploma, but admitted, nevertheless, that a ruinous competition had forced the pharmacist to be a merchant to be able to live. M. Robinet was a representative man in French pharmacy; he was a delegate to and officer of all the International Pharmaceutical Congresses, being Secretary of that at Paris in 1867. As a public speaker Robinet was eloquent and dignified, with great animation; he was quick at catching the public expression, and made an excellent Secretary. His urbanity and politeness were always uppermost, and when he had to say hard things he did it in a way not to wound. It was our good fortune to receive his kind offices, on the occasion last mentioned, in various ways, and at his residence, 3 rue de l'Abbaye St. Germaine, the scene of his labors for science. During his visit to Vienna, in September last, as a delegate to the third Congress, he contracted a cold that resulted in his death.

RICHARD B. GILES, one of the founders of the Pharmaceutical Society of Great Britain, died on the 5th of January, at Clifton, in his 78th year, having been born on the 14th of June, 1792, at Tewkesbury. He was much esteemed by his fellow members." He had the most unbounded veneration for those who were active promoters of the establishment of the Pharmaceutical Society. He was eager to cooperate in every movement for the advancement of Pharmacy, and so late as September last took part in inaugurating a new Local Association."

THE
AMERICAN JOURNAL OF PHARMACY.

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MAY, 1870.  
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ON SYRUP OF ORANGE FLOWERS.

BY J. B. MOORE.

To obtain a fresh and nicely flavored article of orange flower water is often a difficult matter. There is scarcely a distilled water more variable in quality as found in the market. Its tendency to degeneration and deterioration is so great that it is impossible to preserve it for any considerable length of time in good condition. Its delectable flavor and natural sweetness of odor soon become so much impaired as to unfit it for the purposes for which it is generally employed. Preserved with sugar in the form of syrup is the only way in which it can long be preserved and rendered available for use.

As a vehicle or flavor to disguise the taste and improve the flavor of the bitter tonics, rhubarb, various saline and other unpalatable remedies, and to impair the disagreeable odor of some offensive medicines, it is unsurpassed by any of the other distilled or aromatic waters. Its usefulness is not alone confined to its qualities as a flavor, but it also possesses decided remedial powers as a nervous sedative, and is highly esteemed by some medical men for its virtues in allaying nervous irritability and inquietude, and composing nervous restlessness, affording placid and refreshing sleep when other more popular remedies have failed. But owing, I presume, to the great uncertainty experienced by physicians in obtaining a good article when prescribing it, and the feeble and almost worthless character of the officinal syrup, it has lost much of its popularity and has fallen compara-

tively into disuse. It is now rarely ordered in prescriptions except by a few medical men who have experienced its therapeutic value in certain nervous affections. The French employ it very extensively as a nervine.

In conjunction with other appropriate remedies, it not only renders the mixture more palatable, but frequently also increases the therapeutic power of the combination.

I would propose the following formula for making the syrup, which, I think, will give satisfaction, possessing the merit of simplicity and yielding a most excellent preparation :

R. Orange flower water (filtered), one pint.

White sugar, in coarse powder, thirty troy-ounces.

To the orange flower in a half-gallon bottle add the sugar, and shake frequently until dissolved, and strain through muslin. If it is desired to finish the syrup quickly, the solution of the sugar may be facilitated by placing the bottle, tightly corked, in warm water, not too hot, and agitating it occasionally. But heat should not be employed when it can be avoided. In warm weather it is never necessary.

When the demand for the syrup is limited, I would advise that what is not required for immediate use be at once transferred to small bottles, filled to the cork, sealed and kept in a cool dark place, which I have no doubt will insure the preservation of the aroma and flavor of the syrup for a long time. Without this precaution, however, the syrup will keep well. A sample in the possession of the writer, made about the 15th of last September, is now apparently in excellent condition, showing no evidence of change, and with its odor and flavor preserved in great perfection ; while a very carefully prepared sample, made in strict conformity to the officinal formula, began to change and loose its odor in about two months after it was made ; both samples being kept together on the upper shelf in his store-room.

The yield of the above formula is about thirty-six fluidounces, and consequently contains sixteen thirty-sixths or nearly one-half of its bulk of orange flower water, while that of the officinal formula contains but five fluidounces of the latter in forty-four fluidounces of the syrup, or about one-ninth of its measure.

To produce a nicely flavored syrup it is *absolutely* necessary

that great care and scrutiny be exercised in selecting for the purpose fresh and well-preserved orange flower water of the most excellent quality. The best imported into this market is known as "Chiris'," yet I have found this very variable in quality. Different samples of the same importation will sometimes vary very much; the quality of one sample in richness and delicacy of odor and flavor being far superior to that of another, notwithstanding the same care having been bestowed in the preservation of each. I am unable to account for this disparity in quality, nor have I met with any of the importers of or dealers in the article, with whom I have conversed upon the subject, who could give me a satisfactory explanation of the matter. I presume, however, that it is due, in a great measure, to greater care and skill having been employed in its manufacture, or that the finer qualities having been distilled from a finer quality of orange flowers. Hence the importance of much care in selecting the article, as an inferior quality of orange flower water is entirely worthless for any purpose.

The proper *medium* dose of this syrup, when employed for its therapeutic effects, would be for an adult about a tablespoonful, mixed with a little water to relieve its cloying taste. The dose directed in the *last* edition of the United States Dispensatory for the officinal syrup is a fluidrachm, which certainly is a *feeble potion*, especially when the dose of *orange flower water* is a tablespoonful.

Philadelphia, March, 1870.

PILLS AND EXCIPIENTS FOR THEM.

BY THOMAS S. WIEGAND.

The subject of excipients for pill masses has been frequently referred to by the most careful pharmacutists as one of the most difficult of the many that the dispenser has to meet with in the daily routine of his duty; and as the case has generally to be decided at once there is but little time to consult authorities, if indeed anything applicable to the instance is to be found in any systematic treatise.

It was partly in consideration of these facts and at the re-

quest of some medical friends that the few hints here appended are offered to your readers to assist them in this matter.

An excipient should be harmless and tenacious during the ordinary changes of heat and moisture; should remain soluble, even when mixed with those substances likely to harden it, and withal be therapeutically, as well as pharmaceutically, compatible with the remedies it is associated with.

In view of these requirements, gums arabic and tragacanth are both obnoxious to criticism, although they can and are used successfully to make the masses cohere, in a short time they become so hard that they render many pills almost insoluble, and whenever a pill mass can be formed without the use of either of them they should not be employed.

One of the most desirable excipients for substances which are not liable to be deoxidized or reduced, is made by evaporating clear honey to about one-half its bulk. When thus treated honey is very tenacious, and yet is very readily miscible with the juices of the stomach; when used in the proportion of one grain to three of sulphate of quinine the mass is sufficiently firm for making pills which, without any acid, are smaller than those made in accordance with directions of the pharmacopœia.

Ferrum redactum is very advantageously made with this excipient, great care being exercised lest any excess be used, as the great density of mass renders the pills very liable to flatten before becoming dry enough to dispense. The subnitrate and subcarbonate of bismuth are also very elegantly made with this material, the same care being taken to avoid any excess and for the same reason.

Another excipient of this kind, and which remains soluble for almost any length of time, is glycerin, in which one-twenty-fifth part of its weight of finely dusted white tragacanth gum has been mixed; this material was first suggested to me by Dr. J. C. Leamy of Baltimore, Md. After the tragacanth has been added it should stand for twenty-four hours, when it will be fit for use. Pills made with this are quite small, and it is well adapted to such masses as contain dessicated salts such as dried sulphate of iron.

Another excipient which admits of a wide range of applications is extract of gentian; its greatest adaptation being in

those cases where the materials directed are liable to be deoxidized or reduced by combination with saccharine matters; calomel is a most noticeable instance. Nitrate of silver is also a substance that is very advantageously made with this material; previous to being made into a mass it should be mixed with some inert powder, to prevent a too rapid cauterizing action in the stomach. The oxalate of cerium is well formed into mass by this extract. Wax has been recommended, but it is to be eschewed, as it is so nearly unaffected by the action of the juices of the stomach.

Pertinent to this subject of pill masses, excipients, &c., is the propriety of constructing all the formulæ for pills in the pharmacopæia of such quantities that the resulting pill masses should be divided into those numbers which are multiples of twelve. This subject was very carefully and ably argued by Mr. Alfred B. Taylor, in a paper published in the March number of the American Journal of Pharmacy for 1860. The advantages of such an arrangement are obvious to those who make the pills, and all should accede to any change which is harmless, if by doing so the formulæ are rendered more easy of execution. All the pill machines in use by apothecaries are designed to enable them to make twelve, eighteen or twenty-four pills, so that to increase or diminish any officinal formula based upon such a scale merely requires the continued duplication or binary divisions of such quantities.

An examination of the nineteen formulas shows that there are six different series which cannot be reduced to each other by simple duplication or halving.

The change proposed almost precludes the chance of error, and therefore is so much the more desirable.

Philada., March, 1870.

ON SUPPOSITORIES.

BY SAM'L. P. WRIGHT.

An Inaugural Essay Presented to the Philadelphia College of Pharmacy.

Suppositories have been in use for many centuries. Hippocrates, who lived between the years 460 and 357, B. C., used cathartic suppositories, which were composed of honey, soap,

salt, nitre, and powdered colocynth. Until late years suppositories were generally used for the treatment of uterine affections, being but seldom used by introduction into the rectum, and were, consequently, made of a large size—one and a half or two inches in length—and of a weight as high as two drachms. They were made into different shapes, sometimes being spherical and often oval, or oblong, in form. At present they are mostly used by introduction into the rectum, and are usually made of a conical shape. The most convenient sizes are fifteen and thirty grains, the former for children and the latter for adults.* They have been quite extensively used in France for many years; but in this country are comparatively new vehicles for medicaments. They undoubtedly afford a very good mode of administration, especially when the stomach is weak and refuses to retain such remedies as the practitioner may be desirous of employing. Three times as much of a medicine may, in general, be given *per anum* as by the mouth, with a few exceptions, of which are the topical irritants, such as podophyllin, etc.

In England the moulds in general use are those which open. They are made of various shapes and sizes, some having the cavities arranged in a circle, others in one, two, or three straight lines.

One objection to these is that many of them do not close tightly enough to exclude water. Some prefer these, thinking it easier to remove the suppositories from them than any others; but occasionally one or more of the suppositories will adhere to them so tenaciously that they will split upon opening the moulds. To prevent this there have been a number of substances recommended, among which are glycerin and some of the fixed oils.

The moulds, which are made of block tin, or other metals, each being cast separately, and of such shape that they may be placed in a perforated sheet of tin, which is fitted to a suitable tray for cooling the suppositories, are much preferable to those before mentioned. The suppositories may be very readily re-

* When intended for the male urethra they are cylindrical, about two inches long, and 3-16 diameter, cast in a glass tube, cooled, and removed after instantaneous warming by a wooden piston.—Ed. Am. J. Pharm.

moved from these if the inner surface is dusted with lycopodium, or some similar powder, as recommended by Mr. J. B. Moore (Amer. Jour. of Pharm. 3, xvi. 223).

Paper moulds have almost entirely gone out of use.

In the British Pharmacopœia, of 1864, there were two recipes given for suppositories. These formulæ directed the ingredients to be mixed by the aid of heat, and after they cool sufficiently, to be divided into equal parts, which were to be made into cones. These were to be dipped into a mixture of eight parts of lard and one of white wax, melted together, which gave the exterior portion a greater degree of firmness than the interior. In these formulæ there was no butter of cacao, but in the present edition the excipients are mixtures of benzoated lard, white wax, and butter of cacao.

Of all the excipients that have been used for suppositories, the butter of cacao is decidedly the best. It has been used in France for this purpose for more than half a century, and is now in general use in the United States.

Some use a little wax with it for convenience in dispensing in warm weather, which is not necessary in *this* climate, unless the suppositories contain a large proportion of liquid ingredients.

Many practitioners object to the admixture of wax, because the temperature of the body is insufficient to overcome its high fusing point. Those which are made without the admixture of wax, should be thoroughly chilled, and the customer instructed to carry them properly, and to keep them in a cool place. If one is placed in cold water a few minutes before required for use it will be quite firm.

I have found that the best method for dispensing suppositories with dispatch, is to first place the butter of cacao where it will slowly melt, reserving a portion—the quantity to be governed by the amount of the medicinal ingredients to be incorporated—with which the medicaments are to be triturated. This well-mixed mass should be thoroughly incorporated by constant stirring with the melted butter of cacao, which, at the time of admixture, should not be much above 100° Fahr., especially if an extract is present, because some of these will separate, even at a lower temperature.

The aqueous extract of opium is employed more than any other, so I will relate some of my experience with it.

When it is *perfectly* dry it may be reduced to a *very* fine powder, and then incorporated with the butter of cacao. If an attempt is made to powder it when not perfectly dry, small particles will adhere to the mortar and pestle, and it cannot be powdered as fine as it should be. When the extract is in this condition, after it has been powdered as finely as possible, it should be mixed with a small quantity of water (one drop to about fifteen grains is sufficient), and then made into a smooth pilular mass. When the extract is not hard, yet too tenacious to mix with the butter of cacao, it may be rendered quite soft by kneading between the fingers, imparting sufficient moisture by breathing upon it. When the extract is soft, it should first be mixed with about half its weight of butter of cacao. When it doesn't mix readily in the mortar, it may be very thoroughly incorporated by kneading between the fingers for a few moments, when it may be easily mixed with another portion. It would be very convenient, and often save time, by keeping a mixture composed of equal parts of the extract and butter of cacao.

All the extracts which I have had occasion to make into suppositories may be manipulated as above. It has been recommended that the extracts be reduced to a creamy consistence; but this would require a large amount of liquid, which is objectionable.

PUMPKIN SEEDS.—PEPO, U.S.P.

BY BENTON G. DOSCH.¹

(From an Inaugural Essay presented to the Philada. College of Pharm., 1870.)

The pumpkin is a very common and familiar plant, cultivated in most parts of the world. It belongs to the natural order of Cucurbitaceæ: variety Pepo. It attains to the greatest perfection in low and moist situations, often attaining an enormous size, and is the largest of its natural order.

Some kinds are highly esteemed and extensively used as an article of diet, for pastry, &c. The farmers cultivate it for the purpose of feeding cattle, for which it is highly nutritious food. For this purpose, however, they are usually deprived of the

seeds, as the latter are said to diminish the papillary secretions. Of late years it has deservedly engaged the attention of numerous practitioners, as a remedy in tænia. As it has not yet been thoroughly examined, I hereby desire to contribute to the investigations already made, and I think that my experiments will conclusively show to what it owes its virtues as a therapeutic agent.

The seeds are the officinal portion, and to these my inquiries have been alone directed, although the pulp has been used with asserted benefit for the above complaint.

Experiment 1st. One hundred grains of the seeds yielded twenty-five grains of external coating, and seventy-five grains of an oily kernel.

Experiment 2d. Sixteen troy-ounces were treated with one pound of ether by percolation. The percolate thus obtained yielded about five ounces of a viscid fixed oil of an olive green color, changing to a yellowish color on standing. Its taste resembles that of olive oil with a slight odor of the seeds, insoluble in alcohol, soluble in chloroform. I next treated the drug remaining in the percolator with 95° alcohol, exhausting it thoroughly. The percolate was of a pea-green color, and when rubbed upon the hands developed the odor of the seeds in a strong degree. From this I recovered the alcohol by distillation, reducing the product to the average strength of fluid extracts. The distillate gave no signs of anything but pure alcohol, which leads me to suppose that the odorous principle is not volatile.

I next treated four troy-ounces of the seeds with alcohol by maceration, filtered the resulting tincture, and added to it an equal weight of water, which threw down a light precipitate. The latter I allowed to subside and collected it upon a paper filter, dissolved the product in a fresh portion of alcohol, filtered and evaporated, which yielded a substance of a soft resinous appearance, incapable of becoming hard, but rather possessing the properties of an oleoresin. It possessed in a strong degree the odor of the seeds, and was to the taste aromatic, leaving a slight sense of acrimony upon the palate. It is soluble in ether and chloroform, but alcohol dissolves it with greater readiness. I believe it is the principle to which the drug owes its efficacy, and propose for its name Cu-

cubitin, naming it after its natural order, as other species of *Cucurbitaceæ* have been used for anthelmintic purposes, and probably their remedial properties are due to the same active principle.

With the preparations before mentioned, Dr. John C. Hall, of the Philadelphia Hospital, made the following therapeutical experiments. He, however, commenced with an emulsion of four ounces of the seeds in a pint mixture. This was administered to the patient after fasting for twenty-four hours, and followed in six hours by a dose of castor oil. The patient passed a few fragments of the worm. He next administered one ounce of the oil, and followed again in six hours with two fluid-ounces of castor oil, with little effect upon the disease. This dose was repeated under similar circumstances with the same unsatisfactory result. He next used four fluid-ounces of the fluid extract given in tablespoonful doses, with the happy effect of expelling the greater part of the worm.

The latter contributes to verify the statements made in the *Amer. Jour. Pharm.*, May, 1869, by Mr. Chas. Hand, in which alcohol is given place to, as the best solvent for the active principle. But I think that a preparation less alcoholic would be more desirable for administration. I have found that glycerin is a good solvent of the active principle, and I propose it as a menstruum for a fluid extract, combining it in the first instance with alcohol, and lastly to add a small quantity of oil of bitter almonds as a flavoring ingredient.

Take of Pumpkin seeds, sixteen troy-ounces ;

Glycerin, twelve troy-ounces ;

Alcohol, a sufficient quantity ;

Oil of bitter almonds, ten drops.

Bruise the seeds with an equal bulk of dry sand until reduced to a coarse powder. Having mixed the glycerin with a pint of alcohol, moisten the powder with eight fluid-ounces of the mixture, then transfer the powder to a percolator and pour on the remainder of the menstruum. When this has passed, continue the process with alcohol until the percolate measures three pints. Introduce the product into a suitable still and recover two pints of the alcohol. Filter the remainder of the liquid, and add sufficient alcohol to it to bring the fluid extract to the measure of a

pint; lastly add the oil of bitter almonds and agitate until it is thoroughly incorporated. The dose may be from $\mathfrak{z}\text{ii}$ to $\mathfrak{z}\text{ss}$, as the physician may direct.

These experiments further show that the pumpkin seed is a valuable remedy if administered in the proper manner, and as it is a drug that can be easily and cheaply obtained of good quality, which is not the case with many other remedies of its class, it cannot be too highly valued as a therapeutic agent.

NOTE ON THE PREPARATION OF SYRUP OF SENEGA.

To the Editor of the American Journal of Pharmacy :

Dear Sir,—Many readers of your extensively circulated journal have no doubt never been fully satisfied with “Syrupus Senega,” as made according to our Pharmacopœia; the product, though therapeutically efficient, is an eyesore to all who take pride in elegant preparations.

The subject may therefore be worth a short notice, and I would therefore desire to lay before your readers a process I have followed for some time with the best results.

The medicinal virtues of senega reside chiefly in a saponaceous principle,—polygalic acid,—soluble in water, cold or hot, less so in alcohol, which dissolves it when hot, but deposits it upon cooling. With polygalic acid are associated gum, resin, earthy salts, and other inert matter.

Diluted alcohol has been employed as a menstruum to prevent the solution of these useless substances, which would to some extent be taken up by water. Alcohol, on the other hand, extracts the resin, which, when the tincture is evaporated, is precipitated, and the remaining aqueous solution cannot be made perfectly clear by any amount of filtration.

One of your correspondents suggested a process, which consisted principally of exhausting the drug with water, evaporating the infusion to a small bulk, precipitating gum, etc., by alcohol, again evaporating and filtering if necessary, adding sufficient water, and dissolving the sugar. This is a complicated process, subjects the solution to the long continued action of heat, renders several filtrations necessary (and with senega these are very

tedious, more so when the pores of the filter are closed with an abundant precipitate of gum, etc.), and lastly it requires the use of alcohol; this, though cheaper now, is yet worth saving.

Of the merits of the following process, which, in my humble judgment, leaves nothing to desire, I will let your readers judge.

Take of Senega, in moderately fine powder, eight troy-ounces. Moisten this with water, pack into a percolator, and pour on as much water as it will absorb. Close lower orifice of percolator and allow it to macerate for twenty-four hours, then percolate until one pint of infusion has passed. Raise this to the boiling point, filter when cold, pass enough water through the filter to make up the pint, and in this dissolve 24 troy-ounces (or in summer 26) of sugar, and strain.

If the percolation has been carefully conducted, the drug will have been exhausted; if found otherwise, the percolation may be continued to exhaustion and the resulting infusion evaporated. By boiling for a few moments the albuminous principles coagulate, and the filtered solution and syrup are perfectly and permanently clear. The small amount of gum, etc., held in solution can hardly be objectionable; it does not induce fermentation, and the syrup as made above will be found as stable as any. I have kept it on a high shelf in a heated room for over a year, and never observed signs of change or decomposition.

Respectfully yours,

A. A. K.

Baltimore, Md., March 5, 1870.

ON THE ACTIVE PRINCIPLE OF CATALPA BIGNONOIDES.

BY EUGENE A. RAU.

(From an Inaugural Essay presented to the Philadelphia College of Pharmacy.)

This well-known ornamental tree is the largest representative in the Northern United States of the natural order Bignoniaceæ, whither it has strayed from the Southern States, and become fully naturalized. The ample size of its cordate leaves would seem to recommend the Catalpa as a shade tree, but owing to their being rather sparsely disposed and early deciduous, together with the usual uncouth growth of the tree, it is but seldom cultivated for ornament. In the months of June and July the tree

presents a beautiful appearance, with its large and handsome pyramidal panicles of flowers peering through the bright green foliage. The flowers, too, do not appear the less handsome upon close examination, being of a pure white, mottled with rich purple and orange-yellow spots in the throat, and possessing a very pleasant fragrance.

After the early frosts of autumn have stripped the tree of its leaves there remain suspended the cylindrical pods, generally a foot in length; these split transversely to the partition, which extends the full length of the pod. The seeds are numerous, thin, flat and enclosed in a delicate silky envelope, prolonged at both ends into finely fringed wings.

As to the medicinal activity of the various parts of *Catalpa* there seems to exist a variety of contradictory opinions; while many assert the poisonous nature of the bark, others give to it valuable antiperiodic properties. A decoction of the seeds, too, has been recommended in cases of asthma, although their perfect tastelessness does not seem to indicate any medicinal activity. Owing to the latter fact chiefly, the following investigations were confined to the bark, and, moreover, to perfectly new and carefully dried specimens. The outer, corky layer was rejected, and the remaining part or liber retained for examination; this was of a cream color, and possessed, before drying, a rank odor and a nauseous intensely bitter taste. It seemed composed of several superimposed sections of a pithy nature, separated by tough fibrous layers, which rendered the comminution of the bark very difficult. * * * * *

Exp. III. An alcoholic tincture of two and a half pounds of powdered bark was made with stronger alcohol. The resulting tincture was of a deep amber color and possessed the peculiar odor and taste of the bark.

With reagents the following results were obtained: with salts of the Fe_2O_3 a greenish black coloration was produced, showing the presence of tannin.

By the addition of alkalies a red coloration was produced, and with BaCl a light yellow flocculent precipitate resulted.

The alcoholic tincture was then concentrated and evaporated to the consistence of a soft extract. This was then freely washed

with ether, to remove all soluble in that menstruum, repeating the washings with fresh portions until it ceased to be colored.

The ethereal solution was evaporated to an extract, the color of which was a uniform rather dark brown, the taste excessively disagreeable and nauseating. It was acid to litmus and evidently insoluble in water, with which it formed a turbid mixture.

The ethereal extract was redissolved in a mixture of equal parts of alcohol and water, and boiled with freshly precipitated hydrated oxide of lead. Having separated the liquid it was found to be of a straw color, very bitter taste, neutral to test paper and unaffected either by alkalies or iodohydrargyrate of potassium.

Upon evaporating the liquid by means of a water-bath to dryness, the resulting extract was of a yellow color, bitter, insoluble in water, but did not possess the peculiar nauseous taste of the bark.

The PbO was first washed with a small quantity of dilute alcohol and then boiled with stronger alcohol. After filtration, and during spontaneous evaporation, there took place a separation of white quadrangular micaceous scales. These crystals, upon further examination, were found to be insoluble in water or dilute alcohol; sparingly soluble in cold alcohol, but very soluble in ether and chloroform. They were insoluble also in dilute alkaline solutions and dilute acids, and were neutral to test paper, thus seeming to indicate their being a neutral principle. A few of the crystals heated upon platinum foil melted and inflamed, the remaining mass of carbon finally also incinerating, thus proving them to be essentially an organic product. The crystals possessed an intensely nauseous and bitter taste, resembling that of the bark. Upon further evaporation of the mother-liquor no more crystals could be obtained, but a dark resin separated, which was readily inflammable, like the crystals, and possessed their taste.

That portion of the original alcoholic extract which remained after having been washed with ether, was found to be comparatively tasteless, with Trommer's test gave evidence of the existence of glucose, and with sesqui-salts of iron showed the presence of tannin. A tasteless resin was also separated which was insoluble both in water and ether.

SULPHATE OF LIME AN IMPURITY IN TINCTURE OF CHLORIDE OF IRON.

BY DR. ROBERT BATTEY.

To the Editor of the American Journal of Pharmacy.

Dear Sir,—In the March number of your Journal J. C. Wharton comments upon certain “silky white needles, of a lustre something like asbestos,” which he has observed to slowly crystallize down from muriated tincture of iron, and suggests the opinion that it is dissolved off from the glass vessel used, and also the inquiry if it be not silicate of lime.

I have several times observed the same long, slender and delicate needles, in color and lustre just such as he describes, and have likewise observed the following facts :

1st. It is only occasionally that my tincture of iron deposits these crystals, whilst it always deposits more or less of the yellowish precipitate he mentions.

2d. A given sample of muriatic acid, which has been used when the crystals have formed, will uniformly cause their deposition.

3d. That the crystals themselves, when carefully washed and tested both in the wet way and before the blow-pipe, give the characteristic reactions of sulphate of lime.

My opinion is that these crystals are only a trace of sulphate of lime, introduced as an impurity in some samples of commercial muriatic acid, and have no necessary connection with the yellowish deposit.

Rome, Ga., 21st March, 1870.

PHARMACEUTICAL NOTICES.*Editor of the American Jour. Pharmacy :*

Dear Sir,—The following may perhaps interest some of the readers of the Journal :

Aqua Chlorinii Extemp.

Put in a bottle potass. chlorat. 40 grains ; add muriatic acid, C. P., $\frac{1}{2}$ oz. troy. When the bottle begins to get filled with chlorine-vapors add dist. water one fluid-ounce. Stopper the

bottle, and, when the crystals have dissolved, add dist. water up to one pint.

This chlorine water (suggested in Constatt Jahres. 1845, p. 91,) will of course contain chloride of potassium, which will not be of any consequence, = 24 grains KCl in one pint; nor can twelve grains, at most, of acid do any harm in one pint. I would rather dispense chlorine water with a little mur. acid, KCl, but *which does contain* free chlorine, than a water which, made according to U. S. P. once upon a time *did* contain chlorine, but after a few weeks is not much stronger than so much diluted muriatic acid.

As to the above, I make every fourteen days four ounces fresh, and throw away the old.

Excipient for Pills.

Dr. Jenkins recommended once, in the Amer. Jour. Ph., glycerin as an excipient for quinine pills, but said it was not quite the thing. Let me recommend the use of plasma. The use of it originated with a good many in Europe and here in the United States. I began to use it in 1862, and was astonished that nobody knew anything about it here in the Eastern States. When in California in 1867, I found it in general use in San Francisco, Sacramento, &c., and learned there that plasma is the best excipient for pills that have to be silvered; the pills get so *sticky that they need no moistening at all*.

The same caution applies to plasma as to glycerin, viz.: not to take too much, the glycerin oozes out. Of course plasma is not the best excipient for *all* pills. Pil. cathart. comp. U. S. P., for instance; the only proper vehicle here is *water*. Plasma makes a plastic pill mass with camphor pulv.

Fr. Mohr recommends to keep substances which easily attract moisture over unslaked lime or chloride of calcium.* From time to time the lime has to be renewed. Would not powdered ergot, for instance, kept in this way, be reliable to the last grain?

Evaporation to dryness.

When a preparation has to be heated until it does not lose

* Put the lime in a box (tin box) with perforated lid, and put that box in the drawer, saltmouth bottle, or other receptable.

more in weight (till all moisture is driven off), it is customary to put it on the scales from time to time, to ascertain if the requisite point has been reached. This is very troublesome, and Prof. Wittstein proposes somewhere to dispense altogether with the repeated weighings by covering the capsule, crucible (or what else implement is used) from time to time with a dry glass plate. The glass, being always a good deal cooler than the capsule, etc., condenses the vapors of moisture to quite large drops. As long as the glass becomes in the least bedewed all the moisture has not been driven away. When the glass remains dry and clean then you may put the capsule, etc., on the scales, and you will always find that the stable point has been reached.

Frothy Syrups.

Now approaches the time when soda water flourishes, and the following may be of use to some: As a good froth is desirable, hitherto the addition of a little gum arabic has been recommended; aside from the trouble of dissolving it, it does not produce a consistent foam with acid syrups (syr. lemon for instance.) I learnt in California the use of white of eggs. One white shaken with one and a half to two gallons *cold* syrup is sufficient; it produces a persistent foam and imparts, besides (according to my palate at least), a rich, creamy flavor.

Philada., April 5th.

H. M. W.

ON SULPHOCARBOLIC ACID AND THE SULPHOCARBOLATES.

By T. OMAR GUY.

(Extracted from an Inaugural Essay presented to the Philadelphia College of Pharmacy.)

These chemical combinations have quite recently come before the medical world as new therapeutical agents, but have not been thoroughly investigated. There having been no satisfactory process given for their manufacture the subject was presented to me several months ago for investigation; since which time I have experimented with various combinations, and find the following to give the most satisfactory results:

Sulphocarbolic Acid.

This is first formed by combining, by aid of heat, sulphuric

and carbolic acids, in the proportion of 49 parts by weight of the former to 94 parts by weight of the latter, or one equivalent of each according to the old nomenclature.

The mixture is put into a glass flask with a narrow top, into which is inserted a thermometer, and covered over by means of a paper diaphragm, in order to keep the fumes from escaping. It is then placed on a sand-bath and heat gradually applied until the acid is raised to the temperature of 290° F., and kept at this point for ten or fifteen minutes, and then allowed to gradually cool.

At first this forms a thick syrupy liquid of a rich wine color, which, in time, passes into a crystalline mass, composed of small rhomboidal crystals, having a reddish-brown appearance. These again become liquid at or about 80° F.

When the two acids are first mixed, heat is evolved, the temperature being raised to 190° F. Fumes are given off which are again condensed on the sides of the vessel. These have an odor similar to carbolic acid, though differing in some respects.

Sulpho-carbolic acid reddens litmus; with the sesquichloride of iron, also, with the solution of the pernitrate of iron, it produces a beautiful purple color, which fades when exposed to the sun light for a short time. With chloride of barium, nitrate of baryta, and the acetate of lead, it produces a slight opalescence, which is probably owing to a little free sulphuric acid.

Its taste is at first strongly acid, leaving a slight empyreumatic taste upon the tongue. It also has a strong empyreumatic odor, resembling, to some extent, carbolic acid. Its sp. gr. is 1.288; boils at 540° F., and is decomposed at 560° F. into a black, shiny, amorphous mass, having lost all of its odor; soluble in water and alcohol, and gives a decided reaction with the soluble barium and lead salts.

The acid is soluble in any proportion of water, alcohol and ether. It dissolves iodine, and the solution will combine with water without throwing the iodine out of solution.

When heated to 400° F. it becomes of a bright red color, and when cooled forms an almost semi-solid mass. If nitric acid is added to a portion of sulpho-carbolic acid, it is immediately decomposed with violence, nitrophenic acid being formed—a black

oily liquid giving off a peculiarly disagreeable odor, entirely different from that of carbolic acid.

In forming the sulphocarbolic acid I used the chemically-pure sulphuric acid, sp. gr. 1.823, and Calvert's No. 2 carbolic acid.

The interchange of elements which takes place when sulphocarbolic acid is formed may be represented by the following reactions: one equivalent of carbolic acid = $C_{12}H_6O_2 = 94$; one equivalent of sulphuric acid = $SO_3HO = 49$; then $C_{12}H_6O_2 + SO_3HO = C_{12}H_6O_2SO_3HO = C_{12}H_5O, SO_3, 2HO$, which might be considered sulphophenic acid, or a hydrated sulphate of the oxide of phenyl.

Sulphocarbolic acid has been experimented with in regard to its disinfectant properties, and found to be much more efficient than carbolic acid alone.*

With salifiable bases it combines and forms salts, which have been called sulphocarbulates. These have a faint odor of carbolic acid, and are supposed to have its therapeutical properties combined with its respective bases, without its causticity, rendering it suitable for internal administration.

In heating the acid, great care should be used not to heat it too suddenly. There is apt to form at the bottom of the vessel a black liquid, caused by too great a temperature, resulting in the decomposition of the acid.

Sulphocarbonate of Soda.

This salt is at present considered of the most important of the series. It may be produced by taking one volume of sulphocarbolic acid, adding six volumes of water, and completely saturating with carbonate of soda in crystals. The solution is then filtered and evaporated slowly over a sand or water bath until a slight pellicle is formed, when it is set aside to crystallize. When the crystals are all formed, the mother-water may be still further evaporated, and a new crop of crystals obtained.

Should they contain coloring matter, or the crystals not be well formed, a re-solution and crystallization will produce a beautiful salt, free from coloring matter and of well defined rhomboidal prisms, soluble in five parts of cold water at 60° F. and in two-

* Vide Pharmacist, Chicago, Sept. 1869.

thirds its weight of boiling water. Soluble to a slight extent in alcohol, but insoluble in ether.

Sulphocarbonate of soda is a nearly colorless salt, possessing a slight pinkish tinge. It has a somewhat saline, bitterish taste, and a faint odor of carbolie acid; neutral to test paper; produces no precipitate with chloride of barium, nitrate of baryta, or the acetate of lead. With the sesquichloride of iron and the liquor ferri nitratis it produces a beautiful purple color, characteristic of the sulphocarbolic acid.

The crystals should be well dried by exposing them to the air in a warm place on filtering or porous paper.

The reactions which take place when the salt is formed may be represented by the following equation: $\text{NaO}, \text{CO}_2 + \text{C}_{12}\text{H}_5\text{O}, \text{SO}_3 \cdot 2\text{HO} = \text{NaO}, \text{C}_{12}\text{H}_5\text{OSO}_3\text{HO} + \text{CO}_2$.

In heating this salt to a high degree it loses thirty per cent. of its weight, and falls into a grayish white powder, giving a white precipitate with chloride of barium, nitrate of baryta and acetate of lead; with the sesquichloride of iron and the solution of ternitrate of iron it produces a deep reddish color. If the heat is continued to redness it takes fire, and burns without flame. Nitric acid added to a solution of the salt gradually acquires a reddish-brown color.

The therapeutical properties of sulphocarbonate of soda have not been thoroughly investigated. It has been used in phthisis with marked success; also in zymotic diseases with favorable results. It has been given in doses ranging from ten to sixty grains.*

Several physicians of this city have used the sulphocarbonate of soda in the treatment of disease. Among the number the following have been reported. One case was that of Anna E——, having suffered from ozena for several years; the sulphocarbonate of soda was used, varying the strength from two to eight grains to the fluid-ounce of water. It was used twice daily, with Thudicums nasary douche, with the most flattering success.

It was also used as a topical application in a case of syphilitic sore mouth with good results. In this case the strength of the solution used was ʒi to fʒiv of water.†

* London Practitioner, July, 1869. † Cases reported by Dr. Collins.

As a dressing for fetid leg ulcers, the solution of the sulphocarbolates possesses one advantage over the carbolic acid; the acid in oil or paste is at first generally too stimulating, but soon volatilizes, leaving the oil or paste inert. The sulphocarbolates being less volatile, but at the same time possessing the antiseptic qualities, a more uniform application is obtained.

This salt was used in several cases of severe tonsillar ulceration, which all rapidly recovered without the occurrence of suppuration.

It was also employed in several severe cases of scarlet fever, every case of which recovered in a less period of time than under any treatment which had previously been employed in similar cases.*

[The author also treats of the salts of potassa, zinc, lime, baryta, magnesia and ammonia, but our limited space precludes the publication of the whole paper, especially as the salts have been noticed in the last number. EDITOR AMER. JOUR. PHARM.]

TRICHINA SPIRALIS.

BY EDMUND BOCKING.

A case of *Trichina spiralis* occurring here is interesting as eliciting some new points in connection with this not well understood parasite.

A German, named Burdatt, some two weeks since was taken at night with an obstinate diarrhoea, which continued and was accompanied by muscular languor and other symptoms of trichinosis. His wife was also affected the same way. Inquiry now elicited the fact that on the evening of the night of the attack the family had partaken of some raw ham for supper. The attending physician, Dr. H. J. Wiesil, suspecting trichinosis, immediately brought some of the meat to me for microscopic examination. Apparently the ham presented no objectionable features, being rather a piece that would be selected for sweetness and nice appearance than rejected. But under the microscope it became almost a literal mass of parasites—myriads and myriads of the trichina free from their cysts, as well as incysted,

* Vide London Practitioner, July, 1869.

and in all stages of development, being revealed to the view. A careful calculation, based on a mounted section, would estimate the number of parasites to the square inch of meat at 250,000. Some eight or ten days after the meat was eaten a little daughter of the persons alluded to was attacked by symptoms of trichinosis, and it is feared will not recover. In the case of the man and wife they show signs of improvement. One remarkable point in connection with this case is the rapid development of the symptoms of trichinosis; but six or eight hours elapsed from the ingestion of the parasitical meat until the disease exhibited itself. I shall make further investigations of the meat, and any new facts worthy of note, as well as any new developments in the several cases of trichinosis, I will communicate.

In conclusion, I will remark that I have in my possession a quantity of the meat, rich in trichina, that I will exchange with microscopists for other specimens.

Wheeling, W. Va., April 7, 1870.

NOTE ON COD-LIVER OIL AND OTHER PRODUCTS FROM PORTSMOUTH, N. H.

BY THE EDITOR.

Cod-liver oil as a remedial agent continues to retain its value in the opinion of the medical profession, and any information in regard to it is interesting to pharmacutists and physicians. Having recently had occasion to converse with Mr. T. E. O. Marvin, engaged in its manufacture under circumstances favorable to its careful production, we took occasion to elicit some facts, and since to obtain some of the by-products which may become useful in medicine and agriculture, which consist of the pulverulent oily matter, constituting chiefly the solid tissues of the cod-livers, in the form left by the press, and of the emulsive aqueous liquid separated from the same along with the oil by pressure, and which retains all the matters soluble in water that the livers contain.

The first condition necessary to the production of cod-liver oil in its unaltered condition is a sufficient supply of the livers in a fresh state. The position of the harbor of Portsmouth, N. H.,

at the mouth of the Piscataqua River, in relation to the ocean, is so convenient, and never freezes over, that it is well fitted for the fishing trade. There is a large fleet of fishing vessels here, and many more make the harbor a resort to get bait and sell their fish. The vessels run out about thirty miles for fish, starting as early as one o'clock, A.M., so as to reach the fishing grounds by daylight. Each vessel carries five small boats or dories, and eleven or twelve men, who go out, two in each dory, and set their trall lines, which are strung with baited hooks about a yard apart. One man rows the boat as fast as he can, while the other "pays out" the line from the tubs wherein it lays coiled with its two thousand hooks, each baited with a piece of fresh herring. When the trall is set it lays along the bottom of the sea like the Atlantic telegraph cable, a mile long, with small anchors at each end and buoys at intervals. As soon as the trall is all down the men row back to the first buoy, which they find by means of a small flag attached to an ever restless staff upheld by the buoy, and begin the task of "hauling in;" and as it is drawn up the fish are taken off and killed, and by the time the last buoy is reached the boat is usually loaded with noble codfish. Signal is now made to the schooner, which is hovering about the five boats as a hen about chickens. The boats are unladen alongside of the vessel, one by one, and then they steer away for home, to sell the fish and bait the hooks for next day. It is in this way that the supply of crude material is obtained. In reply to our query how they made their cod-liver oil, Mr. Martin says: "It can be told in a few words. First we get the livers when they are new and sweet, and subject them to a carefully graduated amount of steam heat, using only the oil-producing healthy livers, carefully washed and drained before their tissues are broken, so that none of the slime from the stomach or intestines goes into the kettle to make the oil taste or smell badly, as it certainly will if that precaution is not observed. The livers are now subjected to a steam heat which ruptures the oil cells, and causes the oil to rise to the surface, when it is skimmed off. The residue is then put in a powerful press, under strong pressure, and allowed to remain twelve hours, by which the mixed oily and watery parts are mainly separated. Power

is again applied, and more oil is obtained. The pulpy matter is then taken out almost dry. There is a yet finer pulpy matter, which oozes through the cloth of the press at the bottom and sides."

The practical details of "rendering" the oil, as it is called, involving the proper "cooking" of the livers, require some skill and experience, so as to separate it completely and yet not oxidize or expose it unnecessarily, so as to induce acidity or rancidity. That the oil should keep well it must be entirely freed from watery particles; to be but moderately heated, and the process should be executed promptly. Cod-liver oil rapidly absorbs oxygen from the air if exposed, and always should be enclosed in tight vessels immediately after its preparation. Messrs. Marvin Bros. & Bartlett bottle all the oil they make, and thus secure it from change. A sample of this oil received with the specimens was found to be sweet, and free from acidity or rancidity, with the odor and taste proper to this oil.

The pulpy matter left in the press cloth before alluded to, as we received it, was of a soft cheesey consistence, of a yellowish-salmon color, and possessing the odor of good cod-liver oil; but on keeping it with exposure to the air a few days, it acquires a rank, rancid odor of old cod-liver oil, becomes much darker in color, and contracts greatly from loss of moisture. It is strongly nitrogenous, and when distilled with caustic potassa and chloride of ammonium it yields propylamin among other products. So far its only use has been for agricultural purposes, as a manure.

The watery liquid pressed from the livers is presumed to be the material used in Paris to make the extract of cod-liver pills, of which some notice has been presented in the Journals. We had not time to examine this before it spoiled, no means having been taken to preserve it. It was our intention to examine it for iodine salts and for propylamin. If there be any merit in cod-liver oil due to iodine or bromine, it certainly ought to be found in this liquid,—yet it may be questioned whether these agents have anything to do with the therapeutic value of this popular remedy.

GLEANINGS FROM GERMAN JOURNALS.

BY JOHN M. MAISCH.

A new delicate test for alkalis.—Böttger recommends for this purpose an alcoholic solution of alkanin, with which Swedish filtering paper is impregnated; after drying, the paper is to be kept in well corked bottles. The minutest trace of ammonia turns the red color blue. If this red paper has been rendered blue by a very dilute solution of carbonate of soda, the red color will be restored by minute traces of free acids.—*Neues Jahrb. f. Pharm.*, 1869, Mai und Juni, 311.

Pure iodate of potassa, according to Stas, is readily obtained by heating a mixture of equal equivalents of chlorate of potassa and iodide of potassium in a retort placed in a sand bath, just to the temperature of the fusing chlorate. If the temperature is not carried too high, all the oxygen of the chlorate is transferred to the iodide. The chloride formed is extracted by cold water, and the residue is repeatedly crystallized from hot water. The iodate thus prepared never turns yellow on exposure, which is always the case when iodine is oxidized by chlorate of potassa.—*Ibid.*, 312, from *Journ. f. Pract. Chem.* 1869, 251.

To detect copper-arsenic colors, Puscher recommends the use of ammonia, which dissolves them with a blue color, and on evaporation leaves a dirty yellowish-green residue. If the blue solution leaves, on evaporation, a light blue residue, the material was dyed or colored with a blue or green copper compound, free from arsenic.—*Ibid.*, 314, from *Bayer. Gewerbeztg.* 1869, 35.

Adulteration of sulphuric acid.—J. Fleischer has met with oil of vitriol, manufactured in Stettin, in which sulphate of soda or of magnesia had been dissolved to increase its specific gravity.—*Ibid.*, 315, from *D. Indust. Zeit.* 1869, 208.

Preparation of Oxygen at ordinary temperature. By Prof. Böttger.—A mixture of the hyperoxides of lead and barium may be kept for any length of time without being decomposed. If weak nitric acid (of about 9° B.) be added to it, pure oxygen is evolved perfectly free from ozone and antozone; the peroxide of hydrogen which is first generated, in its nascent state, is decomposed by the binoxide of lead, water and ordinary inactive

oxygen being given off.—*Ibid.*, July 28, from *Polytechn. Notizbl.* 1869, 252.

An improved apparatus for Chlorine Water is recommended by Rieckher. For the absorbing vessel he uses two Woulfe's bottles of equal capacity, which communicate with each other by a glass tube reaching from near the bottom of one to the same depth in the other; the last one from underneath the stopper communicates by means of another glass tube with a solution of soda. The first bottle is nearly filled with water, and the generated chlorine is conducted into it beneath the stopper; the pressure of the gas gradually displaces the water from the first into the second bottle, wherein the water is saturated. When the evolution of gas ceases, the rubber connection between the generator and first bottle is closed tightly, the generator and the soda solution are then removed, and the chlorine water slowly syphons back from the second into the first bottle. R. uses for 8 lbs. water 2 oz. bichromate of potassa, and 1½ oz. crude muriatic acid. If towards the close of the process the first bottle is set into a refrigerating mixture of Glauber's salt and muriatic acid, crystals of hydrated chlorine are copiously obtained. The chlorine water with the suspended crystals is then filled into small bottles, the glass stopper is tied over with paraffin paper, and the bottles placed upside down in a vessel containing water, so that it reaches above the mouth of the bottle. Thus prepared and preserved, chlorine water will keep indefinitely.—*Ibid.*, 22—24.

Adulterated Saffron.—Saffron, containing some yellow filaments, was observed to be very full and plump, particularly the latter; it was found to have been treated with glucose to increase its weight. In another lot the pollen, always present to some extent, was found to have been imitated by the addition of 12 per cent. gypsum.—*Ibid.* 38, from *Deutsche Gewerbezeitung*, 1869, No. 22.

To prevent concussions in boiling liquids.—E. Winkelhofer generates in these liquids a gas by means of electricity.—*Zeitsch. f. Chemie*, 1869, 430, from *Ber. d. Chem. Gesellsch.*, Berlin, 1869, 191.

Muriatic Acid free from Arsenic.—A. Bettendorff observed that arsenious and arsenic acid is precipitated from a sufficiently concentrated muriatic acid by the addition of protochloride of tin; the precipitate contains from 96 to 98.6 per cent. arsenic. After this precipitate is removed, the muriatic acid may be distilled, and is then absolutely free from arsenic.—*Ibid.*, 492—494.

Reduction of Metallic Oxides by Hydrogen.—W. Müller has made a long series of experiments to ascertain the temperature at which the reduction to the metallic state takes place with different modifications of the same oxide. We extract only the following, as of particular importance to the pharmacist; the temperatures are in degrees C.: Oxide of iron, prepared by heating of the metal in the air, was reduced when moist at 293° (corrected temperature); when quite dry, at 305 to 339°; presence of nitrogen requires an elevated temperature; prepared from oxalate of iron and moist at 278°; obtained from the nitrate by ammonia, at 286°; previously heated to redness and scarcely soluble in muriatic acid, at the boiling point of mercury. Oxide of zinc is not reduced at the highest temperature attainable in glass tubes. Oxide of lead and red lead are reduced at 310 to 315°; peroxide of lead loses a portion of its oxygen at 310 to 315°. Red oxide of mercury is reduced at 230, the yellow at 127°. Oxide of silver at 70 to 78°; oxide of gold at 85°; oxide of platinum at ordinary temperature.

Auric chloride causes an explosion when heated to above 200° in hydrogen. Bichloride of platinum begins to be reduced at 85°. The chlorides of silver and lead were not affected.—*Ibid.*, 507, 508, from *Poggend. Ann.* 136, 51.

A peculiar balsam of Peru has been met with by Hager in the Berlin commerce, and is either a new variety or an excellent falsification. It is more limpid, lighter in weight, and of a somewhat different odor from the genuine. The mixture of equal volumes of concentrated sulphuric acid and balsam congeals at first in part only; one-third of the volume remains liquid, but congeals afterwards. Petroleum ether dissolves 26, and benzine afterwards 8, altogether 34 per cent. cinnamoin; genuine bal-

sam yields 45 to 50 per cent. This portion was thinner and more yellowish than that obtained from the genuine; it could not be saponified with caustic potassa, and separated on standing, of a milky appearance, while the cinnamein from the genuine balsam separates scarcely turbid and often quite clear. On distillation, this balsam behaves like the genuine. Copaiba could not be found. Its specific gravity is 1.120 to 1.125, of the genuine 1.14 to 1.16. Hager regards it unfit for medicinal use.—*Zeitschr. d. Oesterr. Apoth. Ver.* 1869, 280, from *Ph. Cent. Halle*, ix, 46.

Adulteration of Cochineal.—Finely powdered sulphate of baryta is fixed upon cochineal by some glutinous material. Cochineal leaves $1\frac{1}{2}$ per cent. ashes; in five samples of adulterated cochineal 8, 12, 16, 18 and 25 per cent. of the baryta salt was found.—*Ibid.*, 280, from *Der Apoth.* ix, No. 2.

Pomegranate bark.—Dr. C. Harz reiterates his statement, made some time ago, that the commercial bark of pomegranate root is in reality the bark of the trunk, occasionally intermixed with some root bark. The latter has larger cells, and at a short distance from the cambium the cells of the medullary rays are not elongated, but quadratic. The trunk bark, like that of the root, possesses anthelmintic properties.—*Ibid.*, 303, 304.

Coniferin is a new glucoside discovered by Th. Hartig in the cambial juice of *Abies excelsa*, *A. pectinata*, *Pinus strobus*, *Cembra*, and *Larix europæa*. The cambial juice is boiled, filtered and evaporated to one-fifth; soft acicular crystals are formed on cooling, which are separated by pressure from the saccharine mother liquor, and recrystallized from alcohol or water with animal charcoal.

The silky sharp-pointed crystals lose their water of crystallization at 100° C., fuse at 185, and congeal to a vitreous mass. They are sparingly soluble in cold water and strong alcohol, insoluble in ether. Their taste is faintly bitter. Sulphuric acid colors coniferin deep violet; the muriatic acid solution on heating separates a deep blue precipitate. Its composition is $C_{48}H_{32}O_{24} + 6HO$.—*Ibid.*, 326, from *Journ. f. Prakt. Chem.*, vol. 97.

ON THE BEHAVIOUR OF NARCEINA TO IODINE.

BY W. STEIN.

Dragendorff has described a reaction of narceina which with potassio-iodide of zinc yields hair-like crystals, which are gradually turned blue. According to Stein, this is due to narceina being colored blue by iodine. Solid narceina, like starch, becomes blue by free iodine. Winkler and Pelletier have already observed this reaction, but Winkler did not find it reliable in all cases. Much iodine turns narceina brown; but if water is now added and the excess of iodine removed by ammonia, the blue color appears. An excess of ammonia, like all substances which dissolve narceina, prevent the reaction. In solutions the alkaloid is recognized by adding potassio-iodide of zinc with a drop of solution of iodine, and agitating with ether. In this way 1 narceina in 2500 water may still be recognized. No other opium alkaloid has a similar behaviour.—*Zeitschr. f. Chemie*, 1869, from *Journ. f. prakt. Chem.*, cvi, 310.

ON THE TIME FOR COLLECTING THE LEAVES OF DIGITALIS.

BY F. SCHNEIDER.

The pharmacopœias and text books direct to collect these leaves of the flowering plant. I had the leaves annually collected in the black forest during the latter part of May or beginning of June, requiring always some flowering stems. In appearance I had a beautiful drug, but rarely could I get a satisfactory reaction by tannin and ferrocyanide of potassium in the infusion. In 1869 a botanical friend, formerly apothecary, offered to supply digitalis, which he collected near the end of August and beginning of September, as he had done during his long pharmaceutical practice, from the rosulate leaves of plants, flowering the following year. The digitalis yielded a deeply colored infusion of strong odor and taste, and gave with tannin at once a dense precipitate, with ferrocyanide of potassium after 12 to 15 minutes a strong turbidity. The leaves should, therefore, be collected not in the flowering season, but late in summer.—*Pharm. Centr. Halle*, 1869, No. 49, from *Schweiz. Wochenschr. f. Ph.*

ON THE SOLUBILITY OF SOME CHEMICALS IN GLYCERIN.

BY KLEVER.

The author found that 100 parts glycerin dissolve the annexed quantities of the following chemicals :

Acid. arseniosum,	20	Morph. acetas,	20
“ arsenicum,	20	“ murias,	20
“ benzoicum,	10	Phosphorus,	0.20
“ boracicum,	10	Plumbi acetas,	20
“ oxalicum,	15	Potassæ arsenias,	50
“ tannicum,	50	“ chloras,	3.50
Alumen,	40	Potassii bromid.,	25
Ammon. carb.,	20	“ cyanid.,	32
“ murias,	20	“ iodid.,	40
Antimonii et Potass. tart,	5.50	Quinia,	0.50
Atropia,	3	Quiniæ tannas,	0.25
Atrop. sulph.,	33	Sodæ arsenias,	50
Barii chlorid.,	10	“ bicarbon.,	8
Brucia,	2.25	“ boras,	60
Calcii sulphid.,	5	“ carbonas,	98
Cinchonia,	0.50	“ chloras,	20
Cinch. sulph.,	6.70	Sulphur,	0.10
Cupri acetas,	10	Strychnia,	0.25
“ sulph.,	30	Strychn. nitras,	4
Ferri et Potass. tart.,	8	“ sulphas,	22.50
“ lactas,	16	Urea,	50
“ sulphas,	25	Veratria,	1
Hydrarg. chlor. corr.,	7.50	Zinci chlorid.,	50
“ cyanid.,	27	“ iodid.,	40
Iodinium,	1.90	“ sulphas,	35
Morphia,	0.45		

—*Neues Jahrb. f. Pharm.*, 1869, Mai and Juni, 315, from *Pharm. Zeitsch. f. Russl.*

EXAMINATION OF CUBEBS.*

BY E. A. SCHMIDT.

The January number of *Archiv der Pharmacie*, contains upon pages 1 to 49, an extract from the author's prize essay in an-

* Abridged by Prof. Maisch for the American Journal of Pharmacy.

swer to the query for 1869 of the Hagen-Buchholz'sche Stiftung. The author has used for his experiments, 1st, 10 pounds fresh cubebs, scarcely one year old; 2d, 6 pounds four to five years old; 3d, 10 pounds so-called cubeb stems, that is the rachis with which commercial cubebs are always mixed; 4th, about 1 pound of the sediment, which occurs in ethereal extract (oleoresin) of cubebs.

4500 grm. of the powdered fresh cubebs, containing 4.75 hygroscopic water (ascertained by drying for twenty-eight days over oil of vitriol,) were distilled with water previously distilled and absolutely free from ammonia; after nine distillations (30 pounds distillate each), volatile oil ceased to come over; 14.0 per cent. of oil were obtained, which was found to be soluble in 12820 parts water. The decoction contained mucilage (precipitable by baryta) albumen, starch (estimated from the dextrin and sugar formed by boiling with acids), a little resin (brown, bitter, identical with the resin obtained by alcohol), brown coloring matter (precipitated by hydrated alumina), red brown extractive and salts; sugar was not present.

The cubebs, exhausted by boiling water, were dried and treated with 92 per cent. alcohol; the alcoholic extract was washed with water and separated on standing into a dark green oily liquid, and a more solid red brown resinous mass, from which by distillation with water 9.27 grm. volatile oil of a yellowish green color was obtained. The green fixed oil was separated from the resin by repeated solution in hot diluted alcohol; the resin was dissolved in diluted potassa solution, which left cubebin, obtainable in crystals by the spontaneous evaporation of its alcoholic solution. The resin was precipitated from its alkaline solution by muriatic acid, the precipitate digested with ammonia, the solution precipitated by chloride of calcium, and this precipitate decomposed by muriatic acid, yields the acid resin (Bernatzik's cubebic acid). The ammoniacal mother liquid, on being neutralized, yielded a neutral resin, identical with that left undissolved by the ammonia.

The exhausted cubebs were dried and treated with ether, which took up .511 per cent. green yellow fat. The cubebs now yielded nothing to petroleum ether, bisulphide of carbon, benzine

and chloroform, but potassa solution dissolved some more albumen. Dilute muriatic acid now took up from the exhausted cubebs, besides traces of iron and sulphate of potassa, the following salts in quantities calculated for the 4500 grm. cubebs originally used: 1·6629 grm. phosphate of lime, 18·160 grm. oxalate of lime, 0·880 grm. malate of lime and 21·648 grm. malate of magnesia.

450 grm. exhausted cubebs, previously to being treated with muriatic acid, were incinerated and yielded 15·10 grm. ashes containing silicic, sulphuric, phosphoric and carbonic acids, chlorine, lime, magnesia, iron, sand and some charcoal.

2500 grm. of old cubebs and 4500 grm. cubeb stems were treated in the same manner. The following table gives the results compared with those published by Bernatzik for cubebs.

	Fresh.	Old.	Stems.	B.'s analysis.	
Soluble in water. {	Volatile oil,	14·215	13·041	1·769	9·457
	Coloring matter,	6·940	6·096	7·777	8·100
	Mucilage,	8·187	8·024	7·609	
	Extractive,	4·240	4·860	6·800	
	Albumen,	2·714	2·533	—	
	Starch,	1·782	1·818	—	
	Fixed oil,	1·175	1·096	0·364	0·924
	Cubebin,	2·484	2·576	0·357	0·404
	Acid resin,	0·960	1·106	0·226	3·458
	Neutral resin,	2·558	2·968	2·789	3·515
	Green yellow fat,	0·511	0·408	—	?
	Phosph. lime,	0·037	0·084	0·031	?
	Oxalate lime,	0·403	0·362	0·750	?
	Malate lime,	0·019	0·027	0·004	?
	Malate magnes.,	0·481	0·422	0·011	?
Hygroscopic water,	4·750	3·100	3·350	?	
Cellulose, &c.,	43·066	46·140	65·066	61·600	
Loss,	5·478	5·339	3·097	12·294	
	100·000	100·000	100·000	92·752	
Matter soluble in water.	20·234	19·756	23·235	8·100	

The volatile oil of fresh cubebs consists of two oils, approximately 8·12 parts of spec. grav. 915, and 6·095 parts of sp. gr. 937. Old cubebs contain 7·6 pr. ct. volatile oil, sp. gr. 929 (none of 915), and 5·44 pr. ct. sp. gr. 937. Commercial oil of cubebs was found to be 929. The volatile oil of cubeb stems

was partly of 935, but mainly of 937 spec. grav. The composition of all these oils is $C_{30}H_{24}$; their compound with HCl crystallizes in fine, inodorous and tasteless needles, which are $C_{30}H_{26}Cl_2$.

Cubeb-camphor = $C_{30}H_{26}O_2$ was obtained only from the volatile oil of old cubebs, in which it appears to have been formed from the light oil.

The extractive contains some malate and acetate of potassa, small quantities of chloride of potassium* and sulphate of potassa, with traces of tannin. The extractive of cubeb stems is free from acetates, contains little malate, but is richer in chloride of potassium.

Cubebin is neither a glucoside nor a base; it appears to be more of a resinous nature and becomes amorphous under the influence of various chemical agents. HO,SO_3 colors it cherry red. From his analysis the author deduced the formula $C_{66}H_{34}O_{20}$ (the figures also agree well with Heldt's formula $C_{60}H_{30}O_{18}$.)

The neutral resin of Bernatzik is partly cubebin, rendered amorphous by potassa. The author's neutral resin is yellowish brown, friable, soluble in alcohol and caustic alkalies, little in ether, bisulphide of carbon and chloroform, assumes a carmine color by HO,SO_3 . Composition $C_{26}H_{14}O_{10}$ (the figures also agree well with $C_{60}H_{34}O_{22}$ = cubebin + 4 HO .)

The acid resin (cubebic acid) cannot be obtained by Bernatzik's process. The alcoholic solution of the mixed resins yields with alcoholic acetate of lead a precipitate of cubebate of lead, the neutral resin being not precipitated. Cubebic acid is colored carmine to cherry red by HO,SO_3 . It is white amorphous, and yields amorphous salts; it is soluble in alcohol, ether, bisulphide of carbon, petroleum ether, chloroform, ammonia. Its formula in combination is $C_{26}H_{12}O_{12}$ combined with two equiv. base.

The deposit from the ethereal extract (oleoresin) of cubebs

* When the alcohol is distilled from the tincture of cubebs, and the extract is taken up with ether, numerous crystals are found in the residue. I have repeatedly obtained these crystals, which are chloride of potassium, but no other analysis of cubebs with which I am acquainted mentions that salt. J. M. MAISCH.

consists mainly of crystallized cubebin, surrounded by thickened oil, some fat and neutral resin, scarcely any cubebic acid.

The author has made some physiological experiments upon himself with the different principles isolated by him. The volatile oil in doses of ten drops every two hours produced sensation of heat in the stomach, which diffused over the whole body, headache, loss of appetite, difficulty in swallowing, vomiting, colic, diarrhoea, painful urinating, sleeplessness.

The extractive (10·2 grm. in 48 hours) and cubebin (0·2 to 1·0 grm. six times daily) were without any influence.

The neutral resin produced sensation of warmth in the stomach, little headache and colicky pains, but a considerable diuresis free from pain; the acid resin had similar effects, but appeared to be more powerfully diuretic. The appetite was decreased, and eructations frequent; stool and sleep normal.

Some therapeutical experiments were made by a friend of the author's in a military hospital.

Two cases of recent infection were treated for eight days with eight drops of oil of cubebs four times daily; physiological effects as described before. No effect on the disease; simple injections produced cures in a few days.

One case, having been treated for three days with injections, was now given the extractive, one grm. four times daily for eight days; symptoms of disease rather aggravated.

Two recent cases took 0·5 grm. cubebin ten times daily; dose increased on the third day to one grm., on sixth day to two grm. After eight days no effect upon the organism or the disease.

The resins were given in pills each containing 0·05 grm. Two cases took five times daily five pills, on the second day eight pills, each succeeding day two more (5 times 20 pills on the 8th to the 11th day.) The diuretic effect was apparent on the third day; sense of warmth in the stomach commenced and increased, also burning sensation on urinating. External treatment was then resorted to, and both cases discharged as cured after five and seven days.

The acid resin was given in the same dose and with the same diuretic effect, which was less apparent in a chronic case.

Of the constituents of cubebs, therefore, the two resins only

possess medicinal properties, which are simply diuretic. A preparation which would represent these properties might be made by separating the volatile oil by distillation, drying the cubebs, and preparing with alcohol a resinous extract.

ON A BROWN HAIR DYE.

BY GEORGE McDONALD.

Cairo, Ill., April 14th, 1870.

Editor Journal of Pharmacy, Philadelphia :

The preparation of a lead and sulphur dye for the hair, in which the ingredients would be in a state of perfect solution, has long been as great a puzzle to druggists and other interested parties, as the "quadrature of the circle" to mathematicians, or "perpetual motion" to dabblers in mechanics. But, unlike these, the problem under consideration is really (although, perhaps, unfortunately,) capable of solution.

Some years ago, when lead and sulphur hair dyes were more in demand than they are at the present time, the confident assertion of those who were supposed to know, that such a preparation free from sulphur sediment was a chemical absurdity, prompted me to experiment with the view of ascertaining whether this were indeed true.

The well-known fact that a soluble compound of lead and sulphur could not be obtained by the decomposition of a soluble lead salt by a soluble sulphuret, or, in other words, the insolubility of the sulphuret of lead, was regarded as an undubitable proof of the folly of such an undertaking. But chemistry is at the present day so rich in resources that it is hardly safe to assert that any chemical problem is impossible.

There is a class of salts known as the hyposulphites, many of which are freely soluble in water, and which are readily converted by absorption of oxygen into sulphate of the base and free sulphur. It is in the use of these salts that the key to the enigma lies.

We learn from chemical text-books that hyposulphite of lead is insoluble in water, and if we were to rest satisfied with what knowledge we can obtain of its chemical behaviour from them, we

would be as far from the solution of our problem as we were at the commencement. That hyposulphite of lead is insoluble in water is true, but like many other precipitates insoluble in water, it is readily dissolved by an excess of the precipitant.

Thus, if you add to a solution of *three* parts of acetate of lead a solution of *two* parts of hyposulphite of soda, you will have a white curdy precipitate of hyposulphite of lead insoluble in water; but if to this you add *ten* additional parts of hyposulphite of soda the precipitate will be redissolved, and a perfectly clear solution will be the result. This solution, when applied to the hair, is decomposed by absorption of oxygen from the atmosphere. One of the results of this decomposition is the formation of the dark-brown sulphuret of lead. It is to the formation of this compound in the hair that all lead and sulphur dyes owe their efficacy.

To those whose consciences will permit them to recommend such preparations to their customers, I submit the following formula:

R.	Acetate of Lead,	3ij;
	Hyposulphite of Soda,	3j;
	Rose (or other perfumed) Water,	3xiv;
	Glycerin,	f3ij.

Dissolve the acetate of lead and hyposulphite of soda in separate portions of the perfumed water, filter separately, mix the solutions and add the glycerin.

In a short time after it is made, the solution will become slightly torbid. This may arise either from a small quantity of air which is contained in the liquid, or (perhaps) from the presence of a small amount of oxalic acid with which glycerin is said to be sometimes contaminated. It, however, soon becomes clear by deposition of a minute quantity of dark powder (sulphuret of lead) and remains so, so long as the bottle is kept tightly corked. I think it is quite as harmless as the ordinary lead and sulphur dyes, but this is, at the best, only a left-handed recommendation.

If it is desired to make a two-bottle preparation, like one now on the market, (limpid, fragrant and perfectly innocuous (?),) as the advertisements set forth, all that is required is to put the solution of hyposulphite of soda in one bottle and the solu-

tion of acetate in the other. In this case, however, it will not be necessary to use so large a proportion of hyposulphite of soda, as the two preparations of the article alluded to *curdle* on mixing. The proper proportions would perhaps be those of their chemical equivalents, *i. e.*, about *three* parts of acetate of lead to *two* parts of hyposulphite of soda.

The addition of glycerin to preparations of this kind serves a double purpose. It performs the part of a dressing to the hair, and by reason of its not being absorbed holds the salts in solution, and thus favors the play of chemical affinities.

ON SYRUP OF SENEKA.

By J. B. MOORE.

The formula of the present Pharmacopœia for the preparation of *syrupus senegæ*, although an improvement on that of the edition of 1850, yet by no means affords a satisfactory preparation. Its defects and the objections to it are so familiar to every pharmacist that it is unnecessary to recount them here. The purpose of this paper is to offer a formula and process for the manufacture of this syrup, which, if properly managed, will *never* fail to yield an *excellent* preparation *void* of *all* the objectionable features of the official.

Take of Pulv. Seneka, No. 30, four troy-ounces ;

Glycerin, four fluid-ounces ;

White Sugar, in coarse powder, four troy-ounces ;

Diluted Alcohol, quantity sufficient.

Moisten the seneka with two fluid-ounces of diluted alcohol, and after it has stood in a close vessel six hours, pack it, in small portions at a time, *very* tightly in a glass funnel prepared for percolation, then gradually pour upon it diluted alcohol until one and a half pints of tincture are obtained, or until the drug is exhausted. Evaporate the tincture by means of a water-bath, at a temperature not exceeding 140°, almost constantly stirring, until reduced to six fluid-ounces. When cool, filter through paper, and add sufficient water through the filter to make the filtered product measure six fluid-ounces. To this, transferred to a bottle, add the sugar and agitate it frequently during twenty-four hours. By this time the sugar will be nearly all dissolved,

and its solution may be completed in a few minutes, by placing the bottle in hot water and shaking occasionally. Lastly, add the glycerin, mix well and strain through muslin.

When the demand for the syrup is urgent, the sugar may be dissolved in the filtered liquid at once, by means of a moderate heat in an open vessel, in the usual way of forming syrup, observing to supply the loss sustained by evaporation, by adding sufficient water through the strainer to make the finished product, when *cold*, measure one pint.

Particular attention must be paid to the packing of the powder in the percolator to insure a *perfect* result, as this is one of the most important steps of the process. Its performance requires the exercise of but little judgment as to degree of compression, as it can scarcely be packed too firmly. It is best packed in small portions at a time, in strata of not more than a quarter or half inch in thickness, and should be compressed so firmly that the tincture, when it begins to flow, will not pass at a faster rate than from ten to fifteen drops per minute, which will increase as the exhaustion advances.

I have tried prolonging the preliminary maceration to twenty-four and even thirty-six hours, and after frequent trials could perceive but little *if any* difference in the result. Six hours give ample time for the powder to expand and its fibres to become thoroughly permeated and softened by the menstrum, which seems to be all that is requisite for the complete exhaustion of its medicinal properties.

If the process is managed with any degree of care and skill the exhaustion of the drug will generally be found complete by the time a pint and a half of tincture have passed. But in order to guard against inexperience and unskillful management, I have given the precautionary direction to continue the percolation "until the drug is exhausted."

Notwithstanding my strong predilections and conviction in favor of a finer grade of powders than are generally recommended for percolation, I have varied that preference in this instance, and have selected for the preparation of this syrup a much coarser powder than is directed in the U. S. P. for the same preparation. My reason for doing this is to avoid, in a measure,

extracting the large quantity of pectin and other objectionable inert principles which are taken up when a No. 50 is used. And in order to compensate for this increased coarseness of the powder, I have directed a short preliminary maceration and very close packing of the powder and consequently *slow* percolation, which ensures the thorough exhaustion of the drug.

In percolating seneka in *moderately* fine powder (No. 50,) in making this syrup, even with a menstruum consisting of two parts of alcohol and one part of water, I have upon several occasions found the concentrated tincture, when cool, to become of jelly-like consistence, almost solid, rendering filtration utterly impossible. But when a No. 30 powder is employed all that difficulty is avoided, the tincture is quickly filtered, all the usual impediments attending the manufacture of the syrup are removed, and the process becomes simple and easy of execution.

The syrup as made in accordance with the above formula is of reddish brown color, *perfectly* transparent, *permanent* and deposits but little if any upon standing. A sample of it made last summer is now in excellent condition, with no deposit, and as transparent as when freshly made. Another sample, made about four months ago, in which the sugar was dissolved by means of heat, is also in good condition with the exception that it contains a slight gelatinous deposit, which a strong heat serves to have the tendency to produce after the syrup has stood for some time.

The directions given in the above formula are such that, if strictly carried out, will not only prevent the result just mentioned, but will also shield the medicinal properties of the seneka from the injurious influence which a high degree of heat undoubtedly exerts upon them, and which should always be averted, when practicable, in all the preparations of this drug.

Philada., April, 1870.

REMARKS ON THE GRANULAR SALT OF CITRATE OF MAGNESIA.

By H. C. ARCHIBALD.

Of late years the demand for granular prepared citrate of magnesia, manufactured by the firm of Charles Ellis, Son & Co., of this city, has increased to such an extent as to make it now

quite an article of merchandise, and that, without its being advertised or in any way pushed into the market, the makers relying solely upon its intrinsic value to recommend itself to the notice of intelligent and practical physicians and pharmacutists.

The attention of the writer, who is an employee of the above firm, was first called to the English article of granular citrate of magnesia, so-called, in the spring of 1867, and a few experiments demonstrated the fact that its component parts consisted principally of tartaric acid, bicarbonate of soda, sugar and a trace of magnesia.

To obtain a preparation that could be properly called granular citrate of magnesia, and having at the same time effervescing properties by the direct union of citric acid and magnesia, was found, by the writer, to be impracticable, and the idea was abandoned.

After a series of experiments to ascertain whether a granular salt could be made, which would contain citrate of magnesia and at the same time be effervescent and perfectly soluble, the following formula was adopted, which, if it be strictly adhered to, will afford a beautiful salt, possessing decided laxative properties, and very acceptable to the palate:

Take of Acid Citric, Powdered,	.	.	4 lbs.
Magnesia Calc. (Jenning's)	.	.	1½ "
Soda Bicarb (Chance's)	.	.	3 "
Acid Tart.	.	.	3 "
Pulv. Sach. Alb.	.	.	6 "
Ol. Lemons.	.	.	½ fl. oz.
Alcohol fort.	q. s.		

To the powdered citric acid add the sugar, and mix thoroughly; then add the soda, magnesia, and acid tartaric, pass the whole through a No. 40 sieve three times, to insure its being thoroughly mixed, moisten the powder with stronger alcohol, and pass through a No. 8 sieve, and place on a tray made of wood in a warm room to dry; then add the oil of lemon and bottle instantly. It usually takes twenty-four hours and a temperature of 120° to perfectly dry the salt.

The advantage that a reliable preparation of this kind possesses is evident; it being of known strength, uniform in its

actions, and can be kept indefinitely without injury; it is freely soluble, dissolving almost instantly on being thrown into water, and forming a perfectly clear solution without residue; it has also a pleasant acid taste, and has proven to be a valuable agent in the sick room.

This preparation, like almost all other things, requires skillful manipulating to insure good results. The writer has made several thousand pounds of this salt, and has invariably found that whenever the directions were implicitly carried out, satisfactory products were the results.

The Granular Salts of Kissingen, Vichy, and Saratoga, are also made by the above firm, of which the writer, in a future number, proposes to offer a few ideas as to their mode of manufacture.

ON THE ALKALOIDS OF THE GENUS ACONITUM.

BY DR. F. A. FLÜCKIGER.

From the interesting essay of the author, published in the *Archiv der Pharmacie*, 1870, March, 196-215, we make the following extracts:

In 1857 Schroff's physiological experiments proved the existence in aconite tubers of two principles, one mainly narcotic in its action, and agreeing in this respect with the aconitia in use on the continent of Europe, and particularly in Germany, which has mainly been made by the late F. Hübschmann, of Zurich; the other one being extremely acrid, a property possessed also by "pure aconitia," obtained by Schroff from T. Morson & Son in London, and by pharmaceutical preparations made from bikh, bish, or ativisha, that is the tubers of some species of aconitum, among them aconitum ferox, indigenous to the Alpine regions of the Himalaya mountains. Since that time it was supposed, in Germany, that all English aconitia consists of this acrid alkaloid, for which Hübschmann proposed the name of pseudaconitia (*Schweiz: Wochenschr. f. Pharm.* 1868, p. 189), and gave the following characteristics: It is with difficulty soluble in ether, chloroform, and alcohol, but crystallizes readily, particularly from hot alcohol; it is soluble in hot benzol; is not altered by boiling water, and not colored by cold sulphuric acid; also not

after the addition of nitric acid; it has an alkaline reaction, and a burning, not bitter, taste. True aconitia, however, dissolves in 2 p. ether, in 2·6 p. chloroform, and in 4·2 p. alcohol, without separating in distinct crystals; it is colored yellowish by cold sulphuric acid, has an alkaline reaction, and a bitter, scarcely somewhat acrid taste.

The author confirms the statements of Hübschmann, and adds that pseudaconitia loses nothing in weight at 100° C.; the crystals from hot alcohol constitute thick prisms, which are not colored by hot concentrated phosphoric acid. True aconitia sustains no loss at 100° C., fuses between 110 and 120° without decomposition, and produces a violet color, which lasts for several days, with hot, concentrated phosphoric acid.

Dr. F. obtained some aconitia from T. Morson & Son, also of Hopkins & Williams, in London. The former possessed a purely bitter, not in the least acrid taste, and gave the phosphoric acid reaction both before and after fusion. The aqueous solution of the latter was bitter and distinctly acrid, but the reaction with phosphoric acid was more of a brownish color.

The author also obtained from Mr. Thomas B. Groves, of Weymouth, aconitia, purchased of Morson & Son in 1860 and in 1856; also samples made by Groves, marked respectively amorphous aconitia from *Ac. napellus*, crystalline aconitia from the nitrate, and nitrate of aconitia. The first sample gave a purely violet color with phosphoric acid; 2, 3, and 4 were colored brownish, or greyish violet.

It must be concluded from this, that the aconitia used in England does not differ to any great extent from that used on the continent.

The London house of Roller & Widemann met, in 1868, with a very cheap aconitia, which was examined by Merck (Ph. Journ. and Transact. x. 248), who found it soluble with difficulty in ether and alcohol; it crystallized readily from the latter, and was not altered by boiling water. These are properties of pseudaconitia.

The author ascertained that aconitia is made in England of the East Indian tubers, as well as of those from Switzerland.

An extract which he prepared from bikh-tubers had the physiological effects of aconitia.

Hübschmann discovered in *Aconitum Lycoctonum* two alkaloids—lycoctonina and acolyctina—which latter he found probably identical with his napellina, which is uncrystallizable, insoluble in ether, and not precipitated by ammonia from its saline solutions. Lycoctonina, obtained from its discoverer, was found by Dr. F. to be in white light prisms and needles, of alkaline reaction, fusible and congealing to an amorphous vitreous mass, which, moistened with water, at once forms little bunches of crystals; fusion and recrystallization occur without change of weight. It is readily soluble in chloroform, sulphide of carbon, ether, alcohol, oil of turpentine, amylic alcohol, sweet oil of almonds, and petroleum ether, but requires about 800 p. of water for solution; no color reactions could be obtained with sulphuric, nitric, chromic, or concentrated phosphoric acids.

The author sums up his results as follows:

1. Aconitia is contained in the tubers of the blue flowering European species of aconitum, particularly *A. napellus*.

2. Also in similar species of the himalaya mountains, partly called bikh; among them is also *Ac. napellus* (likewise *Ac. Lycoctonum*.)

3. Aconitia is wanting, according to Hübschmann, in *Ac. Lycoctonum*, which has yellow flowers.

4. Aconitia has the following properties: It becomes soft in boiling water, and imparts a violet color, lasting in the cold for several days, to phosphoric acid, which has been evaporated as far as possible in the water-bath, and has a temperature of 80 to 100° C. The aqueous solution has a bitter taste free of acrimony, is not precipitated by bichloride of platinum, but yields, with iodohydrargyrate of potassium, an uncrystallizable precipitate. It is very readily soluble in ether, chloroform and alcohol (five parts 75 per cent. alcohol at 15° C. dissolve one part.) It is anhydrous and fuses near 120° C. It forms a monochlorhydrate; the nitrate crystallizes well; the free base may be in indistinct microscopic crystals.

5. All aconitia from England, examined by the author, agreed

with these tests; that of Hopkin and Williams also had an acrid taste.

6. The distinctive appellation, "English Aconitia," is wrong (in the sense in which it has been used in Europe.)

7. There exists a base entirely distinct from aconitia, of uncertain origin, but probably derived from aconite tubers (bikh) of Nepal and other Alpine countries of the Himalayas.

8. This pseudaconitia was first noticed by Von Schroff, who named it English or Morson's aconitia. Wiggers proposed the name of napellina. Flückiger called it nepalina. Ludwig suggested acraconitia.

9. Pseudaconitia does not soften in boiling water, is at 100° C. not colored by concentrated phosphoric acid, has a burning, not a bitter taste. It is insoluble in water, little soluble in ether, chloroform and alcohol, but crystallizes from these hot solutions readily in large prisms.

10. Napellina is different from aconitia and pseudaconitia.

11. Lycoctonina is likewise a well defined alkaloid, characterized by the readiness with which it crystallizes after fusion, on being moistened with water; also by the behaviour of its aqueous solutions to bromine water and iodohydrargyrate of potassium (the precipitates on standing, crystallize readily.)

J. M. M.

ON PERU BALSAM.

By K. KRAUT.

To obtain Stoltze's oil of Peru balsam (Frémy's cinnamein), two pounds of the balsam are mixed with the same quantity of ether, and agitated with two pounds of caustic soda solution, containing three or four per cent. NaO. After the separation of the ethereal liquid, the treatment with ether is repeated until it ceases to take up oil. The alkaline solution yields principally resin, cinnamic and little benzoic acid. The ethereal solution, after the distillation and evaporation of the ether, yields nearly 60 per cent. of oil. By fractional distillation under reduced pressure and in a current of carbonic acid, three portions are obtained:

1. At about 200° C. very little benzalcohol, not quite pure.

2. At about 300° C. the largest proportion consisting of benzylo-benzoic ether, yielded with alcoholic potassa solution, benzoic acid and benzalcohol. On rectifying the ether in a current of carbonic acid gas, a portion was obtained in crystals, proving the correctness of Cannizaro's observation, that under certain circumstances the ether will crystallize.

3. At about the boiling point of mercury benzylo-cinnamic ether, yielding with alcoholic potassa solution cinnamic acid and benzalcohol.

Dark colored, thick residues were left in the retort, which might possibly contain styracin and carbobenzoic acid; but on treating the oil of Peru balsam with alcoholic potassa solution only cinnamic and benzoic acids were obtained, and the crude benzalcohol, by fractional distillation and oxydation of the fractions with chromic acid, did not yield any products from which the presence of styron or styracin might be inferred.

Peru balsam, therefore, contains free cinnamic acid, resin and the benzylic ethers of benzoic and cinnamic acids. The small quantities of free benzoic acid and benzalcohol are most probably due to the decomposing influence of the caustic alkali.

Balsam Peru, may, however, like other drugs, sometimes contain benzoic or cinnamic acid in preponderance, and may even occasionally contain styracin.—*Annalen d. Ch. und Ph.*, Nov., 1869, 129–137.

CHLORAL-HYDRATE.

In a communication to the *Archiv d. Pharm.* 1869, Dec., 248, 249, E. Schering, of Berlin, an extensive manufacturer of this new hypnotic and anæsthetic, makes the following statement:

Chemically pure chloral-hydrate ($C_2Cl_3OH + H_2O$) forms white acicular crystals, has a peculiar pungent odor, a somewhat bitter taste, produces in concentrated solution a slight irritation in the throat, fuses and sublimes readily, and keeps well in glass-stoppered bottles, even in aqueous solution. In dispensing, glass, porcelain, or silver utensils are to be used.

It is readily soluble in distilled water; only after prolonged

contact with the atmosphere traces of hydrochloric acid are discernible, which must be carefully neutralized by ammonia if the solution is to be used for subcutaneous injections.

The dose of chloral-hydrate depends on the individuality of the patient and on the desired effect. For internal use Dr. O. Liebreich recommends the addition of mucilago acaciæ or syrupus aurantii; it is important, however, to avoid the use of all alkaline vehicles and correctives, which decompose chloral-hydrate.

The following formulas for administering chloral-hydrate are taken from Dr. Liebreich's pamphlet:

R. Hydratis chlorali, 2·5 (=38 grs.
Aq. destill.
Mucil. Acaciæ, aa 15·0 (= 3ss.)
M. S. Take at one dose. (Ordinary hypnotic.)

R. Hydratis chlorali 4·0 (=62 grs.)
Aquæ destill.
Syr. aurant. aa, 15·0 (=3ss.)
M. S. A tablespoonful at night. (Ordinary hypnotic.)

R. Hydratis chlorali 5·0,
Aquæ destill. 10·0.
M. S. A teaspoonful in a glass of wine, beer or lemonade. (Hypnotic.)

R. Hydrat. chlorali 4·5 to 8·0! (70 to 124 grs.!)
Aq. destill.
Syr. Aurant. aa, 15·0 (3ss.)
M. S. One dose. (In delirium potatorum.)

R. Hydrat. chlorali 2·0 (3ss.)
Aquæ destill. 150·0 (3v.)
Syrupi Aurant.
Mucil. Acaciæ aa, 15·0 (3ss.)
M. S. A tablespoonful every hour. (Sedative.)

R. Hydrat. chlorali 5·0,
Aquæ destillatæ q. s. to make 10 cubic centimetres (f3ijss.)
M. S. 1 to 4 cc.m. (℥ 15 to f3i), for subcutaneous injections.

Dr. Rieckher gives the following tests for pure chloral-hydrate (N. Jahrb. f. Ph., 1870, Jan., p. 15): It has a peculiar odor and taste, is dry and colorless, dissolves clear in its own weight of water, fuses when heated upon platinum foil, and evaporates without residue and without taking fire; the aqueous solution is not disturbed by nitrate of silver; agitated with colorless concentrated sulphuric acid, it becomes turbid without coloration even on being heated; acidulated with sulphuric acid and faintly tinged with permanganate of potassa, no decolorization takes place in two to three hours; nitric acid sp. gr. 1·20 is not colored, nor does it act upon it in the cold or when heated.

Hager (Pharm. Centralhalle, 1870, 9, 10,) gives nearly the

same tests; he has met with a chloral-hydrate (not manufactured in Germany,) in loose glass-like rhombic needles and of a stinging odor. It was soluble in eight parts water; heated in a silver spoon; it burned with a yellow-sooty flame; it sank in concentrated sulphuric acid (pure chloral-hydrate floats upon it), became rapidly liquid, the mixture was much clearer after shaking, and became brown on heating to the boiling point; nitric acid of twenty-five per cent. reacted briskly with the evolution of brown-red vapors; with potassa solution, sp. gr. 1.3, it separated upon the surface a liquid with the odor of chloroform and aldehyde, from which, after agitation, chloroform collected at the bottom (pure chloral-hydrate at once separates chloroform and does not generate the odor of aldehyde). No analysis was made for want of material.

No. 21 of the *Pharmac. Zeitung* states that the chloral-hydrate made by Roussin, of Paris, yielded but 61.7 per cent. chloroform and on examination proved to be an alcoholate of chloral $C_4HCl_3O_2 + C_4H_6O_2$, containing 23.7 per cent. alcohol. It is a semi-transparent camphor-like mass in long adhering needles, of a sharp ethereal odor and burning taste, not deliquescent in water, less soluble than chloral-hydrate. It may be obtained by adding 31.18 grm. absolute alcohol to 100 grm. anhydrous chloral.

J. M. M.

ON BITTER ALMOND WATER.

BY FRÄNZ HÜBNER.

If the directions of the seventh edition of the Prussian Pharmacopœia are strictly followed a good bitter almond water is always obtained, unless the bitter almonds are adulterated with the sweet variety, which fraud is sometimes practised on account of the higher price of the former. The press cakes of bitter almonds, from which the fixed oil has been separated, must be finely powdered and then mixed with seven parts, or if possible, more of soft water. After maceration for twelve to fifteen hours in a close vessel, the water is distilled off by injecting steam, until the requisite quantity is obtained,* which is

* The press cake from 6 parts of bitter almonds, with the requisite quantity of water and 1 part of alcohol, yields at least 6 parts distillate, containing 1 part anhydrous hydrocyanic acid in 720 parts.

usually too strong in hydrocyanic acid, and requires to be diluted. The author adds only one half of the alcohol to the contents of the still, the other half going into the receiver, whereby a water of slight turbidity, not of a milk-like appearance, is obtained. Distillation over free fire invariably yields a weak water, probably in consequence of unavoidable partial overheating.

The author has also used peach kernels, with the following result: 95 lbs. of the same yielded, by cold expression, 25 lbs. of filtered clear, faintly reddish yellow oil, resembling benneseed oil; by warm pressure 8 lbs. filtered oil somewhat darker, 60 lbs. press cakes and 2 lbs. loss including the residue upon the filters. The 60 lbs. press cakes, equal to about 92 lbs. kernels, yielded, when treated as described, 92 lbs. water, from 2 oz. of which 8 grains dry cyanide of silver was obtained, so that an addition of about 18 lbs. distilled water was requisite to reduce it to the strength of the Pharmacopœia, viz. : $6\frac{2}{3}$ grs. AgCy from 960 grains of the water. The water, as thus obtained from peach kernels, is identical with that from bitter almonds.—*Archiv. der Pharm.*, Dec., 1869, 226–229.

ON THE VESICATING ACTION OF CANTHARIDATE OF POTASSA.

By E. DELPECH.

The author, after referring to the ordinary blistering cerate of cantharides of the Codex, and criticising its resinous and fatty ingredients and its uncertainty, suggests that we should look to cantharidin, and says that a mixture of elastic collodion 400 parts, and cantharidin *one* part, spread on adhesive plaster, possesses a very energetic vesicating power.

The volatility of cantharidin, even at ordinary temperatures, the author alleges as a reason for seeking some means of fixing this principle, and having found the memoir of Messrs. Massing and Dragendorff in a German journal, deems the views therein contained afford the means sought.

These authors consider cantharidin ($C^{10}H^6O^4$) as an anhydride, which in its combinations with bases fixes two equivalents of

water, and which makes the formula of cantharidic acid $C^{10}H^6O^4, 2HO$. This acid does not exist in a free state, but is described as forming compounds with the metals.

The cantharidates of potassa, soda, and ammonia are soluble in water, whilst the cantharidates of the common metals are insoluble, and may be obtained by double decomposition.

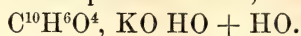
Cantharidic acid is considered bi-basic. Solutions of the alkaline cantharidates, treated with acetic acid, precipitate, not cantharidic acid, but its anhydride cantharidin. This form of cantharidin is more soluble than the ordinary, due probably to its pulverulent state. The author has not directed his researches to the constitution of this acid, nor has he examined the theory of Messrs. Massing and Dragendorff, which he thinks is not supported by sufficient evidence.

Some particles of cantharidate of potassa placed on the arm caused vesication in a rapid manner, without the intervention of a solvent. A morsel of filtering paper moistened with a cold watery solution of cantharidate of potassa has, after drying, caused a vesication perfectly defined. This paper after fifteen days had lost none of its energy, from which the author infers that it is perfectly fixed and stable. It is also as vesicant as cantharidin. Three blisters were prepared, and applied simultaneously; one dry, the second moistened with vinegar, and the third with water. The first took seven hours, the other two five.

Cantharidates are prepared by the direct action of the alkali on cantharidin in the presence of water, and by the aid of heat. The solution is evaporated and crystallized. It presents the form of fine scales. The ammonia salt loses its base at $212^{\circ} F.$; it is acid to litmus. The cantharidate of potassa, on the contrary, is very stable, and has an alkaline reaction with litmus. The soda salt has the same characters.

The author has found another process for the preparation of the potassa salt. Two grammes of cantharidin are dissolved in 150 grammes of alcohol. Then add 1.6 gramme of caustic potassa dissolved in a very little water, and mix them, when the whole becomes a soft crystalline mass, from which the alcohol is separated by pressure.

The composition of the potassa salt is,



98 parts of cantharidin gives 163 parts of cantharidate of potassa. Boiling water dissolves 8.87 per cent. ; cold water 4.13 ; boiling alcohol 0.92 ; cold alcohol 0.03 per cent. It is also insoluble in ether and chloroform.

The author proposes the following formula for a blistering tissue, after numerous experiments :

Take of Gelatin,	30 grains,
Water,	150 “
Alcohol,	150 “
Cantharidate of Potassa,	6 “
Glycerin, a sufficient quantity.	

This liquid is spread uniformly with a brush on gutta percha in thin sheets, so that each square of four inches will contain one centigramme (about one-seventh of a grain) of the cantharidate of potassa. The strength may be varied at will.—*Jour. de Chim. Méd.* Mars, 1870.

EXAMINATION OF SOME OF THE RESINS AND GUM RESINS.

By DR. SACE (of Switzerland.)

(Translated from the German by Chas. Caspari, Jr.)

The author states that, having observed a great analogy between these substances, he was induced to test their chemical reactions, in order to ascertain something more definite about them. The following substances were used by him, in fine powder, in his experiments, viz.: Gum copal, amber, dammar, shellac, elemi, sandrach, mastiche and rosin. The solvents, given below, were used in the quantity of thrice the bulk of gum, and allowed to act upon the same for 24 hours, at a temperature of 59—72° Fahr.

In boiling water resin changes to a semiliquid mass ; dammar, shellac, elemi and mastiche cake, and copal, amber and sandrach are not affected at all. In alcohol, dammar and amber are insoluble ; copal cakes ; elemi is with difficulty soluble ; rosin, shellac, sandrach and mastiche dissolve very readily. In ether, amber and shellac are insoluble ; copal swells ; rosin, elemi, sandrach and mastiche dissolve readily.

In acetic acid rosin swells; the others are not changed. In solution of caustic soda shellac dissolves readily and rosin with difficulty; the others are not affected by it. In bisulphide of carbon, amber and shellac are insoluble; copal swells; elemi, sandrach and mastiche dissolve very slowly, but dammar and rosin readily.

Oil of turpentine dissolves neither amber nor shellac, but dammar, rosin, elemi and sandrach; mastiche is dissolved very readily.

Boiling linseed oil affects neither copal nor amber; dissolves shellac, elemi and sandrach with difficulty, but readily dammar, rosin and mastiche.

Benzole does not dissolve copal, amber and shellac; elemi and sandrach only with difficulty, but dammar, resin and mastiche readily.

Coal naphtha affects neither copal, amber nor shellac; is a poor solvent for rosin, elemi and sandrach, but a ready one for dammar and mastiche.

Concentrated sulphuric acid dissolves all of the substances and colors them at the same time dark brown, with the exception of dammar, which assumes a bright red color.

Nitric acid imparts a dull yellow color to elemi, light brown to mastiche and sandrach, but scarcely affects the others.

Solution of ammonia does not affect amber, shellac, dammar and elemi; copal, sandrach and mastiche swell at first and then dissolve; resin dissolves very readily.

By means of these reactions it will be no great difficulty to test the purity of these substances in commerce.—(*Polytechnisches Notizblatt*, 1869, xxiv, S. 310.)

A NEW ACID COMPOUND OF SULPHUR.

(Translated from the German by Chas. Caspari, Jr.)

When metallic zinc is placed into an aqueous solution of sulphurous acid it gradually disappears, without the liberation of any gas; the result being the formation of sulphite and hypsulphite of zinc. Prof. Schönbein at first called attention to the fact that the solution, during the reaction, temporarily assumes a bright yellow color, and has the power of decolorising indigo, which latter he considered due to an oxidising property

of the liquid, and accounted for it by a temporary formation of ozone.

Recently, Schutzenberger investigated the matter more thoroughly, and July 19th, 1869, reported the result of his researches, contradicting Schœnbein's theory, to the Paris Academy of Science. He found that this discoloration of indigo is by no means due to an oxydation, it being well known that indigo is also discolored and changed to white indigo by powerful reducing agents, regaining its blue color upon exposure to the oxygen of the atmosphere. As indigo, discolored by the above solution, will also regain its blue color upon exposure to air, it is evident that the discoloration is due to a reduction of the indigo, and this effect, together with the yellow tint in the solution, must be owing to the presence of a powerful reducing compound. Its affinity for oxygen is so great that the zinc filings, still moist with the solution, upon exposure to air will become heated to a temperature of 55—60° Cent.; hence its power of reducing must be very great and similar to that of nascent hydrogen. Salts of copper, silver, mercury and lead are readily reduced by it to the metallic state, and bichromate of potassa to oxide of chrome; the salt of copper deposits, besides the metallic copper, also its combination with hydrogen (cuprous hydride.)

After many attempts, Schutzenberger at last succeeded in isolating this new body and examined it more definitely; he found it to be an acid, very unstable in its uncombined state, and succeeded in isolating it only by using an alkaline sulphite in place of free sulphurous acid, by which means he obtained the corresponding salt of the new acid. By allowing zinc to act upon a concentrated solution of bisulphite of soda, he obtained the soda salt of the new acid, possessing the same affinity for oxygen as the free acid, and which can only be kept out of contact with air; the acid is monobasic and its formula is HS_2O_3 . The radical of the acid contains besides oxygen also hydrogen, and this accounts for its great deoxidising property; it gives up the hydrogen of its radical, thus liberating nascent hydrogen. S. names this acid hydrosulphurous acid (acide hydrosulfureux), it being derived from hydrogen and sulphurous acid.—(*Polytechnisches Notizblatt*, 1869, xxiv, S. 365.)

LINIMENTUM POTASSII IODIDI CUM SAPONE.

BY NATHANIEL SMITH.

This liniment owes its place in the British Pharmacopœia to Dr. Rumsey, of Cheltenham, a member of the Medical Council; the formula was supplied to him from the 'Form-book' of the business with which I am connected.

The liniment has been in use in Cheltenham for more than twenty years, and during that period has been adopted by the medical profession in this locality as a preparation in every way more desirable and efficacious than the Unguent. Potass. Iodid.

The formula was copied from a Pharmaceutical Journal of some twenty-five or thirty years ago with a German origin; it was then prescribed with a large quantity of spirit. As soap with spirit of wine in a solid form does not admit of being rubbed in so easily as soap with water, the water process was adopted.

The directions of the Pharmacopœia are not sufficiently clear; for instance, no soap made with vegetable oil could answer well; if pure curd soap, which is made with Russian tallow, were used in the proportion I propose naming, and the directions for mixing followed, I think all who now condemn the preparation would extend to it a verdict exactly the reverse. I recommend,

*White curd soap	.	.	.	.	2 oz.
Iodid. Potass.	.	.	.	.	1½ oz.
Glycerin	.	.	.	.	1 oz.
Distilled water	.	.	.	.	10 oz.
Essential oil of lemon	.	.	.	.	1 dr.

Reduce the soap into fine shreds, and melt in a water-bath with the whole of the water and the glycerin; when the soap is perfectly dissolved, pour it into a No. 9 Wedgwood mortar, in which the iodide of potassium has been previously reduced to fine powder; mix briskly, and continue the trituration until the mortar has become cool, and the liniment assumes the character of ice cream. Set aside for an hour, after which gently rub in the oil of lemons.

* For this use the white curd soap made by Messrs. Gibbs, of the City Soap Works, or Benbow's curd soap.

It will be noticed the quantity of soap in this form is larger than in that of the Pharmacopœia. At Dr. Rumsey's suggestion, and while the B. P. was in process of construction, the glycerin was added; it was subsequently found necessary to increase the soap, and hence the 12 drams were increased by 4 drams.

I purpose sending to Bloomsbury Square a specimen of the liniment made from the above directions.—*Pharm. Journ., Lond. March, 1870.*

Cheltenham, February 18th, 1870.

THE EMPLOYMENT OF BISULPHIDE OF CARBON IN PHARMACY.

M. Lefort has been making experiments upon the employment of bisulphide of carbon in the preparation of what he calls "sulpho-carbonic extracts" of medicinal plants. Since moisture opposes a certain obstacle to the solvent action of the sulphide of carbon, he first dries the powdered vegetables at a temperature of about 50° to 60° C. He then exhausts the dry powder by maceration with several quantities of the sulphide successively applied, decanting and filtering the solution obtained. The exhausted vegetable powder retains about half its volume of the liquid, which can be recovered by distillation. The tincture obtained is distilled by means of a water-bath, the residue being freed from the last traces of sulphide of carbon by heating gently in the open air. When this has been entirely expelled, the odor peculiar to the plant is distinctly apparent. 100 grams of dry powdered leaves of digitalis, belladonna, henbane, stramonium, aconite, and conium have given quantities very nearly approaching to 3 grams in each case; but, if we consider that the plants lose during desiccation three-fourths of their weight, we may conclude that the fresh leaves contain no more than 75 per cent. of principles soluble in bisulphide of carbon.

In all these extracts four chief constituents have been found:

1. A fatty matter, apparently identical in the several cases.
 2. Chlorophylle.
 3. An odorous principle differing with each vegetable.
 4. One or more organic bases in the condition of the salts contained naturally in the plants.
- The presence of

the alkaloids can be rendered evident by their action upon animals and by various reagents, such as iodhydrargyrate of potash or tannin. The purpose for which the author designs these extracts is the manufacture of medicated oils, a class of preparations scarcely ever used in this country; but his memoir is interesting, as illustrating the applications to which this most valuable solvent, bisulphide of carbon, is capable of being adapted. These "sulpho-carbonic extracts" would be worth trying in the preparation, for instance, of certain of the plasters, since they are all easily miscible with fatty matters. Bisulphide of carbon might be employed with advantage to replace ether in certain cases, as well as in such an instance as the following, given by M. Lefort: Camomile flowers contain two odorous principles, the one volatile, the other fixed, but which are both very soluble in bisulphide of carbon. An extract of the flowers can easily be made by first bruising them in a mortar, without drying, and then exhausting as in the other cases. 5 per cent. of semisolid extract is obtained, which unites all the properties of the camomiles.

M. Lefort employs maceration; probably in many cases percolation would be found to answer better.—*Pharm. Journ.*, London, April, 1870.

COD-LIVER CREAM.

To the Editor of the Pharmaceutical Journal:

Sir—The following is worthy of mention in your Journal as an admirable recipe for a preparation that is somewhat extensively vended in several parts of the country under the alluring title of "Cod-liver Cream."

A quarter of an ounce of elect gum tragacanth, steeped in sixteen ounces of cold water for twenty-four hours—during which time it should be stirred occasionally—yields a fine, gelatinous mucilage, which, when mixed in any proportion with Cod-liver Oil and simply shaken with it, permanently diffuses the oil into particles, which in vain struggle for reunion.

It is usual to mix the mucilage and oil in equal parts, and it is further only required to sweeten, and add, as a preservative

and savorer, to each ounce of the mixture one drachm of spirit of wine, to which has been added a drop of essence of lemon, the same quantity of essence of almonds, and a trifle of oil of cassia.

Thus is the *mélange* completed, and of so agreeable a flavor is the result, that to most palates it would be found to acquit itself creditably in comparison with an average custard.

EMULSIO.

--*Pharm. Journ.*, London, April, 1870.

STRYCHNINE AN ANTIDOTE TO CHLORAL.

Dr. Liebreich, the discoverer of the therapeutic action of chloral, has been seeking, and announces that he has found the antidote to this powerful agent.

He first of all established the fact that chloral diminishes the effects of strychnine, provided it is given very promptly after the exhibition of the poisonous alkaloid.

A much more important result has been obtained in another series of experiments which Dr. Liebreich made subsequently to this, and which had for its object to demonstrate the effect of strychnine upon animals poisoned by fatal doses of chloral. The following is an apparently conclusive experiment:

Two rabbits received each 2 grams (about 30 grains) of chloral. After half an hour both were in a condition of profound narcotic sleep; the muscular relaxation was such that they appeared as if dead, the respiration being feeble and slow. A milligram and a half (less than one fortieth of a grain) of nitrate of strychnia was injected into one of them. In ten minutes after this operation the respiration began to resume its activity, the animal moved when irritated, but there were no convulsions; the muscles recovered their tonicity; when the feet of the animal were drawn out he drew them in again. Two hours afterwards the rabbit was sitting up, and four hours after the injection he was completely restored to his usual condition. The other rabbit, on the contrary, which had not received any strychnine, was dead two hours and a half after the administration of the chloral.

A third rabbit, to which no chloral had been given, but only

1½ milligram of nitrate of strychnine, died ten minutes after in violent tetanic convulsions. Nothing similar was manifested after the injection of the strychnine into the rabbit which had previously received some chloral.

It results from these experiments that strychnine, administered after an excessive dose of chloral, cuts short and destroys the effect of the latter, and that without producing its own characteristic action. Dr. Liebreich proposes to make use of injections of nitrate of strychnine in accidents produced by an overdose of chloral or chloroform.—*Pharm. Journ.*, London, April, 1870, from *Comptes Rendus*, 21st February.

LIGHT SULPHATE OF QUININE—A FRAUD.

BY LOUIS STREHL.

A small lot of quinine was recently purchased in this city, bearing the following label: "Light Sulphate of Quinine; Manufactured by Lord Bros., Ludgate Hill, London." The manufacturers being unknown, the "quinine" was submitted to the ordinary tests for its purity.

A casual glance at the article excited no suspicion, but upon a closer scrutiny, the crystals were found to be colorless rhombic prisms, about a line in length, distinct and not interlaced to such an extent as we see them in sulphate of quinia. The taste was bitter, resembling that of the latter alkaloid. The crystalline shape could be readily distinguished by the naked eye.

The crystals were entirely soluble in cold water, and this solution, when treated with chlorine water and ammonia, gave no characteristic indication of quinia. Chlorine water added to a solution of the salt, followed by ferrocyanide of potassium and afterwards by a few drops of water of ammonia, gave no indication of quinia.

The above results show the entire absence of quinia in the so-called "Light Sulphate of Quinine."

An aqueous solution of the salt was precipitated by ammonia and a portion of the filtrate, treated with chloride of barium, gave no precipitate, showing the absence of sulphuric acid. Another portion of the filtrate was slightly acidulated with nitric

acid, and treated with nitrate of silver, which produced a copious white precipitate, soluble in excess of ammonia, showing the presence of hydrochloric acid.

It having been demonstrated that the article contained no quinia, further examination was decided on, having in view the identification of the alkaloid. It is freely soluble in cold and much more so in hot water, soluble in alcohol; cold concentrated sulphuric acid dissolves it without change of color, but an odor of hydrochloric acid is developed; on the application of heat the solution becomes light brown; the crystals are freely soluble, without change of color in concentrated hydrochloric and nitric acids. Soluble in chlorine water without change of color, and upon the addition of ammonia a dirty white precipitate is produced not soluble in excess of ammonia, the liquid filtered from the precipitate was of a straw color.

A solution of the salt, to which a few drops of dilute hydrochloric acid were added, when treated with ferrocyanide of potassium, yielded a copious yellow precipitate. Upon the application of a gentle heat the precipitate dissolved, and the solution upon cooling deposited an abundance of beautiful golden yellow crystals.

These tests, while showing the absence of quinia, furnish conclusive evidence that the alkaloid is cinchonia, containing traces of cinchonidine.

The reaction with nitrate of silver, already mentioned, shows the alkaloid to be in combination with hydrochloric acid. The "Light Sulphate of Quinine" is, therefore, *hydrochlorate of cinchonia*. The latter salt resembles quite closely in appearance the sulphate of quinia, and it is a substitution which might readily pass unnoticed. The manufacturers have taken advantage of this resemblance to perpetrate an extensive and most reprehensible fraud, and it is to be hoped that their field of operation may be transferred from Ludgate to "Newgate," with the privilege of conducting business in the latter locality for an unlimited period.

Chicago, February, 1870.

—*The Pharmacist, Chicago March, 1870.*

FERRI ET STRYCHNIÆ CITRAS.

By N. GRAY BARTLETT.

There is a considerable and increasing demand for this preparation; it is found in commerce containing various proportions of strychnia, usually, however, either one or two per cent. of the alkaloid. It differs also in respect to solubility, one variety being nearly insoluble, and another dissolving readily.

Citrate of iron and strychnia is usually prescribed in solution, and it is the soluble variety that is most generally used and esteemed. Any compound in general use by physicians, containing such a potent remedy as the article in question, should have its composition authoritatively defined; it is for this reason, and with the belief that it is a valuable addition to the *Materia Medica*, that the following process is suggested for the consideration of the revisers of the *Pharmacopœia*.

Ferri et Strychniæ Citras.

Take of Solution of citrate of iron, one pint.

Stronger water of ammonia, a sufficient quantity,
(about two troy ounces and a half.)

Crystallized strychnia,

Citric acid,

Water, of each, a sufficient quantity.

Exactly neutralize the solution of citrate of iron with the stronger water of ammonia, cautiously added; allow the liquid to cool, and accurately determine its weight. Pour one troy ounce on a pane of glass, and set it aside to dry, at a temperature of 90°. Remove the dried salt from the glass, ascertain its weight and re-dissolve it in the solution. Apply the ratio of salt to liquid to the original weight of the solution, and, for every ninety-eight grains of the citrate of iron and ammonia present, employ one grain of crystallized strychnia, and one grain of citric acid.

Dissolve the citric acid in a fluidounce of water; rub the strychnia with the same measure of water, and to it add gradually the acid liquid, stirring until complete solution is effected.

Heat the solution of citrate of iron and ammonia on a water-bath to 120°, and pour into it with brisk agitation of the liquid, the strychnia solution; rinse the mortar with a little water and

add this also to the heated liquid. Mix thoroughly, and allow the solution to stand twenty-four hours. Then filter, evaporate on a water-bath, at a temperature below 150° , to a syrupy consistence, spread on plates of glass, and dry in an atmosphere heated to about 90° .

The salt thus prepared is in garnet-red, translucent scales, soluble in water in all proportions; it contains one per cent. of strychnia, this being considered the most appropriate strength in consideration of the relative doses of the alkaloid, and the iron salt.

The method of assay to determine the proportionate amount of strychnia, is advised to insure accuracy and uniformity. The formula has been used by the writer for several years and has always yielded a satisfactory product. In experimenting upon this salt it was found that the citrate of strychnia was liable to crystallize from solutions containing an excess of acid; a solution of citrate of iron, not quite neutralized with ammonia, deposited almost the entire amount of the alkaloid upon standing twenty-four hours. It appeared in cubical crystals, slightly colored. The writer believes it to be essential to the successful use of this formula, that the iron solution be *exactly neutralized*, an excess of alkali being equally inadmissible. Litmus paper moistened, dipped into the liquid, and afterwards washed with distilled water, gives accurate indications; fresh pieces of paper should be employed in every repetition of the test.

In the experience of the writer the citrate of strychnia will never separate from a neutral solution of citrate of iron and ammonia. If such an occurrence be possible, it will be made evident during the twenty-four hours intervening between the formation of the solution and its filtration; and it is with this object that the interval is prescribed.

The citrate of iron and strychnia is very deliquescent, and will not dry and scale properly if the atmosphere be very humid; accordingly, it is difficult to prepare this salt during the summer months; in winter it dessicates without the slightest difficulty. It is advisable to warm the under sides of the glass before attempting the removal of the salt; the heat thus applied has the effect of loosening it from the glass, and enables the operator to

secure the salt in large, handsome scales. This remark is applicable to all of the scaled preparations of iron, and is of some practical utility.—*The Pharmacist, Chicago, March, 1870.*

METHOD OF PRESERVING DRUGS PERFECTLY DRY.

M. A. Melsens directs attention to the circumstance that dried leaves, roots, herbs, flowers, and other drugs are often kept in drawers or places in which they are imperfectly protected from humidity. In damp weather or moist situations such substances absorb an appreciable amount of moisture. As a consequence they are apt to deteriorate in quality, losing their color, acquiring a musty odor, or becoming mildewed. Even in establishments possessing a properly warmed store-room, it might, nevertheless, be of advantage to possess a simple means of preserving the contents of the shop-drawers in a state of perfect dryness.

The method which he suggests for this purpose is inexpensive and readily applied. It is to place a shallow sheet-iron tray, fitted with a cover of metallic gauze or muslin at the bottom of the drawer or box, which should also be furnished with a good tight-fitting lid. Fused carbonate of potash is placed in the tray, and the drugs allowed to rest on its porous cover. It is easy with this apparatus to effect the perfect desiccation of drugs; and substances possessing delicate odors which it is desired to preserve are better dried by this means than any other. Squills which have become damp and acquired an unpleasant smell, if placed in a box furnished with a tray of carbonate of potash, will in a short time lose their odor completely and become dry and brittle, so that they may be readily powdered. Rose leaves may be thus dried perfectly, their perfume being admirably preserved.

The author prefers fused carbonate of potash to chloride of calcium, quick-lime, or any other desiccating agent. In cases where the substance to be dried contains a great deal of water, it is necessary to change the carbonate of potash once or twice and re-fuse it.—*C. H. Wood, F.C.S., in Pharm. Jour., London, Dec., 1869.*

ON THE ORGANIC MATTER OF HUMAN BREATH IN HEALTH AND DISEASE.

BY ARTHUR RANSOME, M.A.

The vapor of the breath was condensed in a large glass flask surrounded by ice and salt, by which a temperature several degrees below zero was obtained. The fluid collected was then analysed for free ammonia, urea and kindred substances; and for organic ammonia—the method employed being that invented by Messrs. Wanklyn and Chapman for water analysis.

The breath of eleven healthy persons and of 17 affected by different disorders was thus examined, and the results were given in two tables.

The persons examined were of different sexes and ages, and the time of the day at which the breath was condensed varied.

In both health and disease the free ammonia varied considerably, and the variation could not be connected with the time of the day, the fasting or full condition. Urea was sought for in fifteen instances—three healthy persons and twelve cases of disease—but it was only found in two cases of kidney disease, in one case of diphtheria, and a faint indication of its presence occurred in a female suffering from catarrh.

The quantity of ammonia, arising from the destruction of organic matter, also varied, possibly from the oxidation of albuminous particles by the process of respiration; but in healthy persons there was a remarkable uniformity in the total quantity of ammonia obtained by the process. Amongst adults the maximum quantity per 100 minims of fluid was 0.45 of a milligramme, and the minimum was 0.35.

A rough calculation was given of the total quantity of organic matter passing from the lungs in twenty-four hours—in adults about 3 grs. in 10 ozs. of aqueous vapor, a quantity small in itself, but sufficient to make this fluid highly decomposable, and ready to foster the growth of the germs of disease.

In disease there was much greater variation in the amount and kind of organic matter given off.

In three cases of catarrh, one of measles, and one of diphtheria, the total ammonia obtained was much less than in health—less than 0.2 of a milligramme—a result probably due to the abund-

ance of mucus in those complaints, by which the fine solid particles of the breath were entangled.

In two cases of whooping cough it was also deficient, but as they were both children, the lack of organic matter may have been due to their age.

In cases of consumption, also, the total ammonia was less than in health; but in one case of this disease associated with Bright's disease a large amount of organic matter was given off, a portion of it due to urea.

In kidney diseases the largest amount of organic matter of all kinds was found in the breath. The ammonia in one case of Bright's disease was 1·8 milligrammes in 100 minims of fluid, and urea was largely present. Perhaps this fact might be taken as an indication of the need of measures directed to increase the activity of other excretory organs.

In one case of ozæna or offensive breath the total quantity of ammonia obtained was greater than in any healthy subject, but the excess was chiefly due to organic matter.

One convalescent case of fever was examined, and the total ammonia was found to be deficient.

The air of a crowded railway carriage, after fifteen minutes occupation, was also tested by this method, and in about 2 cubic feet 0·3 milligrammes of ammonia and 3 milligrammes of organic matter were found.

With reference to the presence of organic matter in the atmosphere, it was pointed out that the subject was in no way a novel one, and that it had, during the last thirty years, been very fully investigated by many observers, more especially by Schwann, Dusch, Schroeder, Helmholtz, Van den Broeck, Pasteur and Pouchet, but it was shown that it is to Dr. Angus Smith that we owe the discovery of the readiness with which living organisms are formed in the condensed breath of crowded meetings, and the determination of the actual quantity of organic matter in the air of different localities.

Mr. Dancer's calculation of the number of spores contained in the air was noticed, but a source of error was pointed out in the readiness with which organisms are developed in suitable fluids,

even in the course of a few hours. Observations upon the organic particles of respired air had at different times been made by the author.

1. In 1857, glass plates covered with glycerin had been exposed in different places and examined microscopically. Amongst others, in the dome of the Borough Gaol, to which all the respired air in the building is conducted, organized particles from the lungs and various fibres were found in this air.

During a crowded meeting at the Free Trade Hall air from one of the boxes was drawn for two hours through distilled water, and the sediment examined after thirty-six hours. The following objects were noted:—Fibres, separate cellules, nucleated cells surrounded by granular matter, numerous epithelial scales from the lungs and skin.

3. The dust from the top of one of the pillars was also examined, and in addition to other objects, the same epithelial scales were detected.

4. Several of the specimens of fluid from the lungs were also searched with the microscope. In all of them epithelium in different stages of deterioration was abundantly present, but very few spores were found in any fresh specimen. On the other hand, after the fluid had been kept for a few hours, myriads of vibriones and many spores were found.

In a case of diphtheria, confervoid filaments were noticed, and in two other cases, one of measles and one of whooping cough, abundant specimens of a small-celled torula were found, and these were seen to increase in numbers for two days, after which they ceased to develope.

These differences in the nature of the bodies met with probably show some difference in the nature of the fluid given off; but it was pointed out that they afford no proof as yet of the germ theory of disease. They simply show the readiness with which aqueous vapor of the breath support fermentation, and the dangers of bad ventilation, especially in hospitals.

Dr. E. LUND and Dr. H. BROWNE stated that they had also made experiments, the results of which were, in general, confirmatory of those obtained by Dr. Ransome.—*Chem. News, Lond., March 18, 1870.*

ON THE CULTIVATION OF CINCHONA PLANTS UNDER GLASS IN ENGLAND.

BY JOHN ELIOT HOWARD, F.L.S.

Since first I had the satisfaction of raising the *C. officinalis* from seed sent me from the mountains of Uritusinga, I have devoted some attention to the cultivation of different species of cinchona under glass. This has extended over a period of about ten years, during the larger portion of which my experiments have been carried on in a conservatory which I had constructed for the purpose, and which, though on quite a limited scale, enables me to estimate what might be done by means of the appliances at the disposal of the directors of our botanic gardens. I have worked through a fair amount of mistakes and misfortunes, and have now about twenty different forms (species or varieties) of Cinchona in various stages of development; and of these, recently flowering, one plant of the *C. officinalis*,* one of the var. *Colorada del Ray*, and one very forward in bud of the (as yet undescribed) *C. Forbesiana*. I have also still in blossom a plant of the *Howardia Caracasensis* about ten feet in height, and covered with flowers for the last two or three months. Such a result, if exhibited to the whole pharmaceutical world, as it might be at Kew, could not fail to excite interest, and, moreover, the possession of living plants gives the opportunity of observing many things not apparent in dried specimens.

The facilities thus afforded for physiological investigation are also very important to those who delight to trace the beautiful contrivances and manifest design everywhere apparent in nature, and to whom well-observed facts are more interesting than mere mechanical theories of vegetation. As an instance, I was recently examining, together with a botanist well acquaint-

*This plant was cut down, and the produce of sulph. quinine which I derived from it is recorded in my "Quinology of the East Indian Plantation," p. 3. It is now again grown up to a height of 8 feet 6 inches. Mr. Broughton has recently found, in five exceptionally fine trees, descendants of the sister of the above, 6·20 of purified alkaloids per cent.

Or sulphate of quinine (obtained crystallized) 3·46 per cent.

Sulphate of cinchonidin " 1·94 "

Also cinchonine.

ted with the *Cinchonæ* in their native woods, some beautiful trebly-scribulate leaves of my plants, and we agreed that inspection demonstrated the improbability of a theory recently advanced as regards the scribulation, which ascribes its origin to an inherited defect derived from the attacks of insects. The truth being, on the contrary (as I have often observed), that insects are not found to attack this part of the leaf in preference, but are much more addicted to some other portion of the plant. The additional beauty of the leaf derived from the scribules and their regularity must be seen to be appreciated; presenting an appearance quite unlike that of an accidental monstrosity.

As to the light to be thus thrown on botanical arrangement, I may mention the opportunity afforded of raising the seeds proceeding from the same bunch of capsules, and observing thus, as I am doing at the present moment, the amount of variation to be observed in the children of one parent plant.

The very difficulties to be overcome in imitating, as far as possible, the climate and soil of the mountain regions of the Andes, present many subjects of not unfruitful consideration.

The influence of light upon vegetation will force itself upon the attention in all the varied aspects of the question, as, indeed, presenting some of the most formidable difficulties in the cultivation of plants so sensitive as these are to the deficiency of stimulus in the dreary months of winter, and to the excess both of heat and light in our summer above that to which they have been accustomed. The effect of different colored rays, of polarized light, of a greater or less amount of actinism necessarily comes into view.

The leaves of many species are particularly sensitive to light, and turn towards the rays of the sun in a manner sufficiently remarkable. In some kinds the structure and coloring are very beautiful, and would quite repay cultivation, with this object in view. They are frequently covered with a lustrous epiderm, as described by Dr. Weddell, in reference to the *Calisaya*. This epiderm seems, as in the case of some other plants, largely composed of wax: when this is removed, either by mechanical injury or by chemical solvents, the leaf suffers, and the oxidation of the juices becomes manifest. It is not easy to imagine from

dried specimens, the great variety of structure and characteristic peculiarities which the leaves present; but when once well observed, the aspect of the plant fixes itself in the memory.

The respiration of plants, as affected by a too retentive soil or by too abundant application of water to the roots, has to be studied, and it is also necessary to mark the period of hibernation or repose, and to encourage rather than to interfere with rest at this period, a period which seems in India to be very accurately marked, and which even under glass, it is not difficult to trace.

Then the nutrition of the plants will require much care. It may, at first sight, seem requisite simply to provide the needed soil; and very pure sand, such as Reigate sand, rich loam, and bog earth, in proportions, varying according to the species,—when mixed, as I find desirable, with broken brick,—will sufficiently afford this. But there is more than this; for we shall find, if we study the plant, that it is desirable to supply it at the period of its most active vegetation with food ministered, as much as possible, in a liquid form, and therefore more easily assimilated. For as regards the life and growth of the plant, we may, in a certain sense, adopt the saying of Thales, that “all things are from water,” for all things must be in solution (either aqueous or aerial) before they can be changed into the living substance of the vegetable. Now the natural solvent is rain as it falls from the clouds, and in the normal state (as observed by Weddell and Markham) of the *Cinchonæ*,* the roots spread superficially through a loose mass of earth and decaying vegetation, amidst which they absorb, together with the rain-water, various mineral substances, and also gases, especially carbonic acid, presented to the spongioles in the manner most to their advantage.

M. H. Struve† has recently demonstrated the existence, under certain conditions, of nitrite of ammonia, together with ozone and oxygenated water in rain and snow; and M. Deville has found in snow and rain, collected in the neighborhood of the

*The *C. succirubra* prefers a stronger soil, and, perhaps on this account, is more easy to cultivate than some others.

† “Journal de Pharmacie et de Chimie,” November, 1869, p. 357.

hospice of St. Bernard, a similar composition, at least in so far as nitric acid and ammonia being present in greater or less quantities. I learn from Dr. Anderson that some species of cinchona flourish at Darjeeling, although the rainfall averages 127·30 inches for the year,* of which 82 inches fall in three months of the summer. But then the character of the soil and slope of the hills is such that the rain-water, after having bathed the roots, passes away immediately from them; for Dr. Anderson, as every one else, finds the Cinchonæ to be most impatient of water at the roots.

This is difficult to imitate, and the change consequent on the scarcity of rain-water to that derived from springs has (apparently) cost me the health of some valuable plants. Then, again, as the leaves can form chlorophyll only in sunshine, and can only *then* derive nourishment from the air, it must be remembered that, in dark and gloomy weather, we must supply less water and less nourishment to the roots, or the harmony of nature will be destroyed, and the consequences may be fatal. From the same considerations it will follow that too much artificial warmth in the night season will be injurious; and, indeed, the plants never seem to thrive better than when a considerable range of temperature between day and night is allowed to exist. I have found great practical benefit from adopting the system of *double glazing*, leaving a stratum of air about four inches in thickness between the sheets of glass. This tends greatly to prevent sudden chills, which are injurious, and also to retain a larger amount of moisture in the air surrounding the plants. This is much required and best secured by syringing the leaves with tepid water twice in the day, avoiding the collection of water around the roots. It is important to provide well for their drainage by means of broken bricks or tiles; and I find an advantage in conducting the warm water of the return pipes below the level surface of the ground, so as to secure a slight and constant elevation of the temperature. I have a thermometer plunged eighteen inches in the bed of earth in which my largest plants grow, and I have not noticed this below 50° F. in winter.

*²Beardmore, "Manual of Hydrology," p. 330.

I think that the proper range of temperature might be placed at from 55° F. in winter to 65° in summer.

It is very important to allow as much access of fresh air as possible. It must be remembered that these are mountain plants, loving free air and alternate mist and sunshine, whilst the hot, close atmosphere of the lower valleys is always injurious to their perfection as quinine-producing plants, and generally fatal to their growth.* The very condition of *life* depends on the constituent molecules of an organized body being never all in repose; and whilst these are, on the one hand, received from without, on the other hand effete particles are continually expelled from the plant, whilst others are deposited in the formal tissues, thus building up gradually the solid portions of the structure. In this manner plants live, grow, multiply under the influence of the vital force; and if these phenomena were more constantly under the notice of our writers on Nature, we should perhaps be able nationally to elaborate something better than mechanical theories of life, force upon our acceptance with an amount of confidence bearing an inverse ratio to the proofs produced. We should, perhaps, not be told that "there is no real difference between vital and physical forces." Even the theory of cell-formation as the origin of all living things, though true as to the manner in which nature works, yet does not elucidate her mysteries. It seems to solve more than it really does explain, for what is the cell but the boundary within which nature carries on

* I have recently had the opportunity of observing the same result as produced by similar causes in India. Two specimens of red bark were sent over for analysis from "Balmadies," a cinchona plantation belonging to Mr. Rhode. One of these presented the usual appearance of East Indian *succirubra* bark. Mr. Broughton informs me that it was grown in a valley adjoining the Neilgherries, at an elevation of about 4000 feet. Mr. B. made an examination of it. Though actually lower in elevation than the site of the lower Crown barks on the Nediwuttum plantation, which produce much cinchonidine, it is tolerably rich in quinine. "The climate differs from these latter by this peculiarity, that during the dry season fogs and mists roll up each day from the western coast and moisten the leaves, and *shade* them from the baking Indian sun." The other specimen had the aspect of the *C. rubra dura* of the Germans, and contained less quinine, but more than twice as much cinchonidine. It came "from the hot bottom of the valley."

her operations?* and, after all, what are these? and what is life? Whoever watches the manner in which nature acts the ædile with her cells—(“diruit, ædificat, mutat quadrata rotundis”)—will think little of the cell itself, and much of that which it contains. If I take in my hands a brick, I have a specimen of material by which, through adding brick to brick, the four walls of a house may be constructed; but I should not be able thence to reason out the nature of the stirring active life which those boundary walls might contain. The addition of brick to brick might very well illustrate the phenomena of crystallization, but the activities of life within the plant much more resemble the course of reconstruction of a great city like Paris, in which an imperial will, availing itself of the all-arranging genius of a subordinate functionary, acts for the good of the whole, and, caring little for the four walls, or for any number of them, if standing in the way of its well-devised projects, adapts the materials even of previous structures to the exigencies of the new thing that has to be produced; and who will deny that the result is admirable?

It is thus that practical experience in cultivation leads to the review of theories which must be cast aside when they have served their turn, or demolished when they stand in the way of real *science*, which means *knowledge*, and not *speculation*.

In the address of the President I observe with pleasure the remark that “a country stroll of half an hour will yield material for thought and investigation available for many a day;” and may we not extend the application of the lines which he has quoted to the more difficult, but not less remunerative, objects of study presented by the cultivation of plants in circumstances so different to those of their native habitat? The very difficulties we encounter are a source of pleasure in overcoming them, and enable us to appreciate more fully that infinitely varied Wisdom which has appointed everything beautiful in its season, and all things in measure and number and weight. *No quid nimis* is a golden rule for every one that attempts to cultivate

* See “Chemismus der Pflanzenzelle,” von Dr. H. Karsten. Wein, 1869, pp. 5, 6, etc.

the cinchonæ under glass. To neglect this would be to ensure failing in the undertaking.—*Pharmaceutical Journal, London, January, 1870.*

CHLORODYNE.

BY EDWARD SMITH, F.C.S.

Judging from the papers that have recently appeared in the "Pharmaceutical Journal," it would seem that there still exist great doubts as to the actual composition of this popular remedy.

There have been published two formulæ for the preparation of chlorodyne,—one known as Dr. Ogden's, and quoted by Royle in his "Materia Medica," the other to be found in Squire's "Companion," and two more distinct and divergent formulæ can hardly be conceived. It may be worth while, perhaps, to put them side by side.

Dr. Ogden's (Royle).

R Æther. Chlor. 3j
 Chloroform 3vj
 Tinct. Capsici 3ss
 Ol. Ment. Pip. gtt. ij
 Morph. Mur. gr. viij
 Acid. Perchlor. gtt. xx
 Tinct. Cannab. Ind. 3j
 Theriacæ 3j
 Acid. Hydrocy. Scheele ℥
 xij.

Squire's (Companion).

R Chloroform 3iv
 Æther 3j
 Sp. V. Rect. 3iv
 Theriacæ 3iv
 Ext. Glycyrrh. 3iiss
 Morph. Mur. gr. viij
 Ol. Ment. Pip. ℥ xvj
 Syrupi 3xviiss
 Acid. Hydrocy. dil. 3ij.

Dr. Ogden, I believe, published his formula as resulting from analysis, and Squire says his formula has been represented to him as the true one; it is plain, however, either that Dr. Ogden's analysis is worthless, or that Squire's information is derived from unreliable sources. Dr. Ogden gives the amount of morphia as eight grains in about nine drachms; Squire gives it as eight grains in about thirty-five ounces! The proportion of chloroform, too, differs enormously. In the first it amounts to about two-thirds, in the latter to about one-eighth. Dr. Ogden says nothing of ext. glycyrrh., syrup, sp. v. rect., or ether, and on

the other hand, Squire omits all mention of acid. perchlor., tinct. cannabis, or capsicum.

I have not met with the particulars of Dr. Ogden's so-called analysis, and in truth I am very much inclined to doubt if any *chemical* analysis has been attempted, as the formula bears the impress of improbability on the face of it, *i. e.*, supposing that Collis Browne's chlorodyne be intended; for instance the dose of the latter as marked on the label is from ten to thirty drops; now this would contain, if Dr. Ogden is right, from seven to twenty drops of chloroform, a dose which very few practitioners would care to venture upon, particularly as it is to be repeated at certain intervals, and in combination with from a sixth to half a grain of morphia per dose. I rather suspect that Dr. Ogden's analysis has had more of a physical character attached to it, the organs of taste and smell having perhaps greatly assisted the supplementary chemical tests.

The dose of chloroform in Squire's is not unreasonable; but that of morphia, viz. the 1·200th to the 1·70th of a grain, is palpably absurd, and so homœopathic that it might practically be omitted from the compound. The only conclusion fairly deducible from a comparison of the two formulæ is, that neither of them can be said to represent the well-known Browne's chlorodyne.

The results of an examination I have recently made of the genuine compound may not be uninteresting to pharmacists.

The positive detection and isolation of the alkaloids in complex organic mixtures is not always a very easy task, more especially when they exist in small proportions. I started with the intention of simply satisfying myself of the presence or absence of morphia; however, the examination gradually developed itself, and ultimately I managed to make out with tolerable precision what I believe to be the actual composition of this preparation.

Genuine chlorodyne has a sp. gr. of 1·216, and reddens blue litmus paper. Distilled over a water-bath, it yields an opaque distillate, evidently a mixture of two or more fluids; on the addition of an equal volume of water, the distillate separates into three distinct layers. The upper one has an ethereal

pepperminty odor and taste, and is in fact oil of peppermint dissolved in ether. The ether may be recognized by the ready inflammability of its vapor.

The middle layer, separated by a pipette and gently heated with a few drops of hydrochloric acid and potassium chromate, gradually assumes a green coloration, owing to the reduction of the chromate, and indicating the presence of alcohol—a tincture probably. The odor of hydrocyanic acid is given off during the heating. This layer also gives a precipitate with silver nitrate, insoluble in nitric acid and sparingly soluble in ammonia, revealing hydrocyanic acid.*

The lowest layer, heated gently with caustic potash, yields with silver nitrate a precipitate insoluble in nitric acid, and which blackens by the further application of heat, owing to the reduction of the silver formiate, indicating the presence of chloroform.

The residue in the retort, consisting of a dark, semifluid paste, dissolves in water, and has a very pungent, peppery taste of capsicum. This aqueous solution gives a precipitate with alcohol, basic plumbic acetate, and ammonium oxalate, revealing the presence of gum, and also gives the usual glucose reaction with the potassio-cupric tartrate. The non-volatile alkaloids would of course be found in the residue in the retort after distillation, but the coloring matter adheres to its solution in water, etc., with such pertinacity as to render the usual tests very unreliable, and therefore a fresh sample of the original compound is required, to satisfactorily determine their presence.

The following is the plan I adopted to isolate the alkaloids:—

Digest the chlorodyne with twice its volume in alcohol, containing a few drops of acetic acid at a warm temperature, say 50° to 60° C. for four or five hours, occasionally shaking the mixture. The whole of the gum and much of the coloring matter

* In the preliminary examination of complex organic mixture for hydrocyanic acid, Schönbein's guaiaco cupric test promises to be useful. Thus, the presence of hydrocyanic acid in chlorodyne may be determined in a few seconds by this test. It must be borne in mind that *free* nitric acid and chlorine give the same reaction, but not their compounds, neither do acetic, hydrochloric, sulphuric, or phosphoric acids.

are thus precipitated. After filtration, the alcoholic solution is gently evaporated until it thickens, being careful not to push the evaporation too far, as the glucose in the solution very soon blackens. To this semi-liquid extract is added water, and the whole gently heated with a solution of potassium bicarbonate, containing a little caustic potash, and set aside to deposit.

This precipitate of alkaloids is separated by filtration and digested with ether, until nothing more is dissolved. All the alkaloids likely to be present in chlorodyne, such as atropia, are soluble in ether, with the exception of morphia, which remains undissolved. The residue, insoluble in ether, is treated with acetic ether, in which it speedily dissolves. A small portion of the ether solution undergoes no change on the addition of potassic iodomercuride solution, but by evaporation yields a very minute residue, which has an intensely pungent and burning taste, being evidently impure capsicine. All my attempts to obtain evidence of the presence of atropia failed.

The acetic ether solution gives a copious precipitate on the addition of potassic iodomercuride solution, and by evaporation yields microscopic crystals, which, on the addition of a few drops of acidulated water, give the usual morphia reactions with nitric acid and neutral ferric chloride, thus satisfactorily demonstrating the presence of morphia.

From the above it will be seen that chlorodyne consists essentially of chloroform, morphia, ether, hydrocyanic acid, and capsicum, with the addition of gum and treacle as vehicles, and oil of peppermint as a flavoring ingredient. Tincture of Indian hemp does not appear to be present, as the alcoholic extract is soluble in water.

The quantitative estimation of the several component parts of chlorodyne is in some respects a very tedious process, but it may be roughly made as follows:—The chloroform by distilling a known quantity, and adding to the distillate a given volume of water,—the chloroform is thus isolated, and, if a graduated measure be used, its volume at once read off; at the same time the amount of spirit, plus hydrocyanic acid, may be noted, and the oil of peppermint, plus ether, which floats on the surface. If the hydrocyanic acid be now estimated by precipitating with a

known weight of silver nitrate, the amount of spirit is a simple matter of calculation.

The gum readily separates on the addition of alcohol, and may be washed, dried, and weighed, or a known volume of water added to the precipitate, in which it speedily dissolves, the increase in volume will approximately give the amount of gum. The capsicum does not exist in sufficient quantity to admit of measurement.

The morphia may be estimated by evaporating the acetic ether solution to dryness, dissolving in water slightly acidulated with acetic acid, and cautiously neutralizing with caustic potash (being careful to avoid excess, which redissolves the precipitated morphia), filtering and weighing. It is necessary to operate upon at least four ounces of chlorodyne to arrive at anything like satisfactory results. The potassic iodomercuride solution precipitates morphia from its solutions, but unfortunately the reaction is not sufficiently reliable to employ it as a quantitative test. The amount of treacle may be estimated pretty closely by calculation after all the ingredients have been accounted for.

The composition of chlorodyne, then, I put as follows:—

R	Chloroformi	. . .	f. ʒiv
	Morphiæ Mur.	. . .	gr. xx
	Æther. Rectif.	. . .	f. ʒij
	Ol. M. Pip.	. . .	ʒ viij
	Acid. Hydrocy. Dil.	. . .	f. ʒiv
	Tinct. Capsici	. . .	f. ʒvj
	Mist. Acaciæ.	. . .	f. ʒj
	Theriacæ.	. . ad	f. ʒiv.

Misce.

This does not give so dark a compound as the original, because the latter contains caramel, but as this has no medicinal or other value, I have omitted it, making up to the required volume with the treacle.

In conclusion, I would suggest to those who care to use this formula, that it be known and prescribed as “liquor chloromorphiæ comp.,” which explains sufficiently well its essential constituents, and is a name which cannot be confused with any advertised or quack compounds.—*Ph. Jour., Lond., Jan., 1870.*

THE PREPARATION OF SOAP FOR SOAP LINIMENT.

By C. H. WOOD, F.C.S.

The process given in the British Pharmacopœia for the preparation of *linimentum saponis* is, I believe, founded upon the results of some experiments communicated to the Society by Mr. Deane in 1859. Mr. Deane found that when good Castile soap is macerated in the spirit at a temperature below 70° F., the oleate of soda dissolves, while the margarate of soda remains to a great extent insoluble, and the resulting solution does not lose its limpidity by the application of moderate cold. If, on the contrary, the whole of the soap be dissolved by digestion with heat, the liniment gelatinizes on a reduction of temperature. From this it follows that good soap liniment should consist of a solution of oleate of soda, as free as possible from the alkaline margarate or stearate. Hence Castile soap, which is prepared from olive oil, is the only commercial soap adapted to the purpose, the other soaps being made from solid fats, and containing a much smaller proportion of the oleate. Mr. Squire mentions in his book an experiment indicating that white Castile soap is soluble to the extent of 80 per cent. in cold rectified spirit. This is the soap described in the Pharmacopœia, and I have no doubt that if the process there given for preparing the liniment be carefully followed, it yields a sufficiently satisfactory result. Nevertheless, if a soap could be obtained containing a still larger proportion of the soluble constituent, it would doubtless be preferred. For some time past I have prepared such a soap for myself by a very ready method, and have found it to possess considerable advantages.

To produce a soap as rich as possible in oleate of soda, an oil should be selected containing the largest proportion of olein and the smallest quantity of solidifiable constituents. Almond oil is therefore better suited for the purpose than olive oil, and it is from this material that I obtain my product.

The saponification of oil as commonly performed is a protracted and somewhat tedious process to conduct on the small scale. For this reason, probably, chemists are not in the habit of preparing their own soap. But if, instead of boiling the oil and

alkali together until they unite, the oil be first treated in the cold with $\frac{1}{20}$ th of its weight of strong sulphuric acid and allowed to remain for twenty-four hours, it is rendered so soluble in liq. sodæ that its conversion into soap becomes a matter of the utmost facility. Adopting this plan, I have found the process to be one of the easiest of pharmaceutical operations. The acid mixes freely with the oil, forming a blackish-colored fluid. On the addition of the soda this color entirely disappears, and the soap obtained is quite white. The following is the method of procedure I have found to be the most convenient:—

Almond oil	1 $\frac{1}{4}$ pound (av.),
Sulphuric acid	1 ounce (weight),
Liq. sodæ	10 pints (Imp.)

Add the acid to the oil, stirring the mixture. Allow this to remain for twenty-four hours. Then pour it into the liq. sodæ contained in a clean iron vessel, and apply heat. Very shortly after it boils, the liquid becomes perfectly bright and transparent; the fire is then removed, and the whole allowed to become perfectly cold. The soap is then found as a coherent cake floating on the top of the liquor. It is laid on a calico filter, and left to drain for several hours; or, if it is desired to obtain it perfectly free from all traces of caustic alkali, it may be redissolved in 10 pints of boiling water, and a strong solution of 5 oz. of common salt added. As the mixture cools, the soap rises to the surface; and when quite cold, again forms a fine layer, resting on the aqueous liquid. No loss of weight is thus incurred. The soap is placed on calico to drain, after which it may be submitted to moderate pressure, or melted in a tared dish, and reduced to a uniform weight of 2 $\frac{1}{2}$ pounds. When thoroughly cold, it forms a firm white soap, which may be cut into pieces, and kept for use in a covered pot.

In the preparation of *linimentum saponis*, this soap is macerated in the spirit in the cold. It very quickly dissolves, especially if the mixture be agitated. From 4 to 5 per cent. of the weight of the soap remains insoluble, as a flocculent deposit. After this is filtered out, a pale liniment is obtained, which may be kept at 32° F. for any length of time without thickening or depositing. The *Pharmacopœia* does not direct the soap to be

dried before use. Fresh soap usually contains from 30 to 40 per cent. of water, and I think it best to employ it in this moist condition.

Soap may be quite as readily made from olive oil by the foregoing method, but I think the use of almond oil will be found to present several important advantages. Although the latter is the dearer material, it does not sensibly affect the cost of the liniment, because the soap is to a greater extent soluble; consequently, the quantity of product is increased, and the proportion of spirit retained in the undissolved matter is saved.—*Pharm. Jour., London, January, 1870.*

NOTE.—The high price of oil of almonds in this country will preclude the use of that oil in the preparation of an extemporaneous soap. The use of the sulphuric acid is to destroy or separate the glycerin as sulphoglyceric acid when the saponification of the oily acids is more easily effected. It is suggested, as a more appropriate method when it is desired to get a soap liniment consisting mainly of oleate of soda soap, that the ordinary white Castile soap be dissolved in the alcohol in such excess that the less soluble margarate of soda may crystallize out by careful cooling, separated on a cloth and expressed, and thus prevent the annoyance arising from change of temperature in winter.—EDITOR AMER. JOURNAL PHARMACY.

MEDICINAL DRAGEES AND GRANULES.

BY ERNEST AGNEW.

The large extension given to this agreeable form of pill, and its adaptability to a host of substances usually administered in that manner, necessitate a few remarks on their manufacture, more especially as in England they seem to be less employed or less appreciated than in America or on the Continent, where it is usual to keep genuine *dragées* of various strengths, ranging from one grain to five of rhubarb, aloes, and various other simple and compound pills, sugar-coated; an advantage apparently much appreciated by customers, who rarely fail to renew a request for the same. The method adopted in their manufacture is one of admirable simplicity, but succeeds best on a large scale, unfortunately preventing its use for the general work of a dispensing counter. But the numerous special pills constituting

the "patent," or leading article of nearly every pharmacist, can be made quicker, better and more advantageously than by the ordinary method, even where aided by machinery. The ingredients for the pills should be thoroughly mixed and sifted, so as to form a fine, impalpable powder. With some substances of an untenacious character it is necessary to add a little dextrine, sugar, or gum. The sugar granules forming the nuclei of the pills are either to be bought from the wholesale confectioners under the name of *nonpareils*, or are easily made by agitating and rubbing together coarsely sifted sugar and syrup in a large copper basin over a slow charcoal fire.

The granules, weighing each about one-tenth of a grain, are measured out so as to furnish the requisite number of pills, and are introduced into a large copper basin suspended by two ropes from a bar of wood, capable of revolving horizontally on an iron bolt fixed in the ceiling. A small charcoal fire is lit in an open pan under the basin, and serves also to keep warm a quantity of syrup, with which the granules are moistened from time to time, and continually rubbed and agitated with a little of the powder, added very gradually, the basin being rapidly rotated, and jerked upwards occasionally. This operation, which must be repeated an indefinite number of times, until the *dragées* are completed, requires considerable skill on the part of the manipulator, for if too much of the excipient be added at once, it dissolves the previous *couche*, and prevents the regular formation of the concentric layers of which each *dragée* is built up, much in the same manner as starch granules are by some supposed to be formed. The final coating with sugar is the least difficult part of the operation, and is done either with syrup alone, or with the addition of a little plaster of Paris, very brisk agitation being required, so as to avoid any agglomeration of the *dragées*, the temperature being so regulated as to dry the sugar without a possibility of melting it. Or, in the case of certain pills, where sugar-coating is undesirable, owing to its discoloration by the ingredients of the kernel, such as in pills of iodide of iron, etc., copal and balsam of tolu dissolved in ether forms an excellent coating, easy of application, and effective in results.

The advantages of making large quantities of pills by this

process may be briefly summed up: firstly, the rapidity with which they are made, a clever workman easily making a batch of 100,000 pills in a day and a half; secondly, their uniform roundness and pleasant appearance contrasted with that of ordinary pills; thirdly, their compactness and hermetic enclosure, which insures their keeping without change, and at the same time allows of their easy solution in the stomach, envelope and excipient being both perfectly soluble.

Granules containing 1 milligramme of powerful medicines, such as arsenious acid, sodic arseniate, digitaline, aconitine, etc., are much prescribed by continental physicians, especially in Italy; and where a regular or gradually increasing dose of any such medicine is required, no system so completely fulfils the prescriber's intentions, combined with so little inconvenience to the patient. In making these granules, the active ingredient is usually dissolved in the syrup, the bulk being merely powdered sugar. Thus in making 10,000 granules of sodic arseniate, dissolve in 500 grammes of syrup 10 grammes of the arseniate, with which gradually moisten the granules, the operator rubbing and agitating them the whole time to prevent their adhesion.

Leptandrin, assafoetida, and many other nauseous substances, are commonly encased in sugar by our American *confrères*, who certainly display much ingenuity in the manner in which they cater for public patronage, some of their convenient inventions having become quite indispensable to the upper class of that country. At the works established at St. Denis by M. Menier, and now belonging to the Pharmacie Centrale of France, the *dragées* and granules are made by steam-machinery, and the rapidity of the operation is increased by a blast of warm air driven upon the basin, which revolves eccentrically, rendering it almost impossible for the granules to adhere to each other. Sugar-coated semen-contra is also much used as a pleasant remedy for worms in children, their resemblance to caraway comfits conducing much to their easy administration. But here we are trenching on the domains of the confectioner, from whom many a lesson is to be learnt in the art of rendering nice and attractive much which is in the crude state, to say the least, disgusting and repulsive.—*Lond. Pharm. Journ., March, 1870. Paris.*

ASSAY OF COMMERCIAL ACETIC ACID.

BY M. GASTON TISSANDIER.

Acetic acid, sometimes called, in commerce, pyroligneous acid, generally contains about 40 per cent. of acetic acid, $C_4H_4O_4$; it is sold by the acidimetric standard, which is determined by means of a titrated alkaline liquid.

Acidimetric Standard.—Preparation of the Alkaline Liquid.—We have already shown how the alkalimetric sulphuric acid may be prepared accurately; this well-verified solution, containing 100 grms. of sulphuric acid per litre, is the basis of the preparation of the alkalimetric liquid which, in laboratories, is used to effect nitrogen determinations or to take acidimetric standards.

Any quantity whatever of pure caustic soda—15 or 18 grms., for instance—is dissolved in a litre of water. 10 centimetres of the normal sulphuric acid liquor (containing 1 gm. of SO_3HO) are taken and poured into a small precipitating glass; to this is added some sensitive tincture of litmus, and the solution of caustic soda poured into it drop by drop by means of a graduated burette, divided into tenths of c.c., till the red litmus becomes blue—that is to say, till the acid is saturated. Let us suppose that 50 c.c., or 500 divisions, of our alkaline solution are required to saturate 10 c.c. of the titrated sulphuric acid liquid. We know that 500 divisions saturate 1 gm. of sulphuric acid, and we can calculate, according to the equivalents, what quantity of acetic acid will saturate a certain volume of our liquid; we know, for example, that 500 divisions ought to saturate 1.224

$$\text{grms. of acetic acid, } C_4H_4O_4: \text{—in fact, } \frac{49 (SO_3HO)}{60 (C_4H_4O_4)} = \frac{1}{x}$$

Before thus standardizing the alkaline liquor of caustic soda, it is well to add some slaked lime, to prevent it from carbonating, which would interfere with the sharpness of the coloration of the red litmus into blue. Before using this liquor, the bottle which contains it is shaken, and left to settle, so that the lime may be deposited at the bottom; the solution, becoming clear in a few minutes, is then poured into the graduated burette, which is used to take the standard of pyroligneous acid under assay.

According to arrangements between the buyer and seller, the standard of this acid is taken either by *volume* or by *weight*. In the former case 1 c.c. of acetic acid is saturated, in the latter 1 gm.

In order to take the standard by weight, a small glass, containing in it a 10-grm. weight, is tared on a sensitive balance. Equilibrium being established, the 10-grm. weight is taken out, and the acetic acid to be tested is then gradually poured into the glass by means of a small tube, so as to regain the equilibrium. We have thus, by double weighing, obtained 10 grms. of acetic acid, which are to be diluted with water so as to give a volume of 100 c.c.

After this solution has been rendered homogeneous by shaking, 10 centimetres of it are removed, corresponding to 1 gm. of acetic acid. Instead of directly weighing 1 gm. of the acid to be tested, it is better to weigh 10 grms. of it, as we have indicated; because, in case of a verification being needed, it is easier to measure 10 c.c. than to commence a fresh weighing.

The 10 centimetres deducted are placed in a precipitating jar, litmus is added, and the alkaline soda liquid poured in, drop by drop, till the litmus becomes clearly blue. If 150 divisions have been used, we shall obtain the acidimetric standard of pyroligneous acid by the following equation—

$$\begin{array}{rclcl} 500 \text{ divisions saturate} & . & . & 1.224 \text{ grs. of } C_4H_4O_4 \\ 150 \quad \text{“} \quad \text{will saturate} & . & . & x. \end{array}$$

whence—

$$x = 0.3672.$$

100 grms. of the assayed acetic acid contain, then, 36.72 grms. of $C_4H_4O_4$, which is expressed by saying that its standard is 36.72°.

When the standard is taken by volume the operation is the same; only, instead of weighing 10 grms. of the acid, 10 c.c. are measured.

Examination for Mineral Acids—Acetic acids are sometimes adulterated with mineral acids (chlorhydric and sulphuric, &c.), which augment their standard.

To detect their presence, 50 c.c. of acetic acid are heated to the boiling-point with 1 or 2 centigrms. of starch, and left to

boil about twenty minutes. When the liquid has become cold, some drops of tincture of iodine are poured into it. If a blue coloration of iodide of starch occurs, the acetic acid contains no mineral acids; but if this coloration is not produced, we may be certain of the presence of mineral acids, which, under the action of heat, have transformed the starch into dextrine, and thus prevented the formation of the iodide. Care must be taken to pour the iodine into the cold liquid, for iodide of starch is decolorized spontaneously under the action of heat. Chlorhydric acid may also be immediately detected by adding to the acetic acid a few drops of nitrate of silver; and the presence of sulphuric acid is discovered by chloride of barium. In the latter case, it must not be forgotten that chloride of barium is insoluble in acids, and that the acetic acid ought to be diluted with a sufficiently large quantity of water to avoid the possibility of error from this cause.

Pyroligneous acids generally standardize 39° to 40° ; however, this figure is not absolute. We have sometimes met with samples containing only 34 per cent. of acetic acid, others having 46 to 50 per cent., and even still larger quantities.—*Chem. News, Lond., Jan. 21, 1870.*

Minutes of the Philadelphia College of Pharmacy.

A stated meeting of the College was held at the College Building, December 27th, 1869; the President, Dillwyn Parrish, presiding. [This was the first meeting under the revised By-laws, making the meetings of the College quarterly in place of semi-annually as heretofore.]

The minutes of the last stated meeting and all of the several adjourned meetings were read and approved. The minutes of the Board of Trustees being read by the Secretary of the Board, inform that Louis G. Bauer, C. F. Gristock, Clemmons Parrish, Andrew C. Blair, Henry C. Eddy, James S. Robinson, Geo. W. Kennedy, W. G. Buchanan, Samuel Campbell, Louis A. Baker, Wm. McIntyre, Henry K. Bowman, M. G. Rosengarten and Jos. R. Dugan were elected active members of the College. Also that at a meeting of the Board on the 5th of October the following gentlemen were elected corresponding members of the College, viz.:

Great Britain.—Prof. John Attfield, London; Henry B. Brady, Newcastle-on-Tyne; John Abraham, Liverpool; T. B. Groves, Weymouth; Chas. Tichbourne, Dublin; F. Crace Calvert, Manchester; John Mackay, Edinburgh; W. W. Stoddart, Bristol; J. C. Brough of London.

MINUTES OF THE COLLEGE.

Germany.—Dr. H. Ludwig, Jena; Dr. L. A. Buchner, Munich; Dr. J. B. Henkel, Tübingen; Dr. Rieckher, Marbach; Albert Frickhinger, Nördlingen; A. Margraff, Berlin; Dr. Carl Schacht, Berlin; Dr. Franz Beckert,* Vienna; Anton von Waldheim, Vienna; Dr. Clamor Marquart, Bonn.

Switzerland.—Dr. J. J. Bernouilly, Basel; A. Gruner, Bern; L. Ladé, Geneva.

France.—Augustine Delondre, Sevres; Prof. L. R. Le Canu, Paris; Dr. J. Leon Soubeiran, Paris; M. Stanislaus Martin, Paris; M. S. Robinet,† Paris; M. Francois L. M. Dorvault, Paris; M. A. Gobley, Paris; Prof. A. Chevallier, Paris; M. Paul Antoine Cap, Paris; Prof. — Planchon, Paris.

Netherlands.—M. Walter, Amsterdam.

Belgium.—Dr. A. Von Bastelaer, Charleroi; Prof. Norbert Gille, Brussels.

Prussia.—Dr. G. Dragendorff, Dorpat; Dr. Arthur Casselman, St. Petersburg; Dr. Bjoerklund, St. Petersburg.

Italy.—Louis Mosca, Turin; Nicholas Sinimberghi, Rome.

Egypt.—Dr. Gastinel, Cairo.

Brazil.—Dr. Theodore Pecholt, Cantagallo.

The Committee on Sinking Fund report the collection of \$55, and an additional subscription of \$50 to the Building Fund. The Treasurer of the late Building Committee informed that there was to his credit as Treasurer, interest amounting to \$113.60.

A. B. Taylor made a verbal report for the Committee appointed to confer with the Committee of the different medical societies on the subject of legislation to prevent adulteration in drugs and medicinal preparations. The Joint Committee, after a number of sessions and free conference on the merits of proposed measures, designed to effect the purpose desired, finally concluded to recommend to the several bodies represented in the Committee the draft of the law proposed and considered by the American Pharmaceutical Association, as embodying a better plan than any other which has been brought to their notice for the suppression of adulteration and sophistication of drugs and medicines.

CHAS. BULLOCK,

Secretary.

March 17, 1870.

A special meeting of the College was held for the purpose of electing delegates to the Convention for revision of the U. S. Pharmacopœia, to assemble in Washington in May next. Nominations having been made, the following gentlemen were elected to represent this College in the convention, viz.: Wm. Procter, Jr., Prof. John M. Maisch, Alfred B. Taylor.

CHARLES BULLOCK, *Secretary.*

* Died March 5th, 1870, at Vienna.

† Died December 6th, 1869.

March 28, 1870.

The Annual Meeting of the College was held at the College Building. The President, Dillwyn Parrish, Presiding. The minutes of last stated meeting and of special meeting were read and approved.

The minutes of the Board of Trustees were read by A. B. Taylor, Secretary of the Board, and on motion approved. These minutes inform that, at the Annual Commencement of the College held March 22d, at the Academy of Music, the diploma of the College was conferred by President Dillwyn Parrish, on 51 graduates, whose names and theses are as follows:

LOUIS W. ADAMS, Philadelphia, Pa.....	<i>Pepsin.</i>
GEORGE W. BARTON, Philadelphia, Pa.....	<i>Physiology of Plants.</i>
JOHN M. BRENNAN, Philadelphia, Pa.....	<i>Percolation.</i>
MILTON G. BRIGGS, Philadelphia, Pa.....	<i>Heuchera Americana.</i>
EDWARD CHILES, Frankfort, Ky.....	<i>Spiritus Frumenti.</i>
SILAS B. CLARK, Vermont.....	<i>The Country Drug Store.</i>
WM. C. CONNALLY, Atlanta, Ga.....	<i>The proposed Law for the practice of Pharmacy.</i>
HENRY H. DINNING, New York.....	<i>Cimicifuga Racemosa.</i>
BENTON G. DOSCH, Chambersburg, Pa.....	<i>Pepo and Vattel's Mass.</i>
WILL. RUSH EHLER, Lancaster, Pa.....	<i>Filtration.</i>
CHARLES L. FINCH, Philadelphia, Pa.....	<i>Treatment of Poisons.</i>
A. F. GERHARD, Philadelphia Pa.....	<i>Socotrine and Cape Aloes.</i>
C. L. GROFF, Philadelphia, Pa.....	<i>On Tinctures.</i>
G. OMAR GUY, Chicago, Ill.....	<i>Sulphocarbotic acid and the Sulphocarbolates.</i>
JOSEPH J. HALL, Nashville, Tenn.....	<i>Analysis of Squire's Citrate of Magnesia.</i>
WM. H. HANCKER, Philadelphia, Pa.....	<i>Cannabis Indica.</i>
JOHN B. HANNAMAN, Philadelphia, Pa.....	<i>The Root of Baptisia Tinctoria.</i>
S. E. R. HASSINGER, Philadelphia, Pa.....	<i>Ilex Verticillata.</i>
LLEWELLYN HELFRICH, Philada., Pa.....	<i>Black Alder.</i>
EUGENE HERBERT, Philadelphia, Pa.....	<i>Carbotic Acid.</i>
LOUIS W. HILDENBRAND, Philada., Pa.....	<i>Coptis Trifolia.</i>
JOHN F. HUDDART, Louisville, Ky.....	<i>A plea for the more general use of Fluid Extracts.</i>
THOMAS HUNTER, Philadelphia, Pa.....	<i>Ceratum Plumbi Subacetatis.</i>
OTWAY E. HUTCHINGS, New Orleans, La.....	<i>The number of drops to a fluid drachm.</i>
HARRY R. KERVEY, West Chester, Pa.....	<i>The Life of a Drug Clerk.</i>
JOSEPH J. KIRKBRIDE, Philada., Pa.....	<i>Arsenicum.</i>
CHARLES S. LEE, Bridgeton, N. J.....	<i>A first class Drug Store.</i>
WALTER LEHMAN, Philadelphia, Pa.....	<i>Podophyllum.</i>
THOMAS J. LIGHTCAPP, Allentown, Pa.....	<i>Chloral and its Hydrate.</i>
SAMUEL LOTT, Philadelphia, Pa.....	<i>Lycopus Virginicus.</i>
ED. H. LUCKENBACH, Bethlehem, Pa.....	<i>Euonymus Atropurpureus.</i>
JOHN T. McLAUGHLIN, Peoria, Ill.....	<i>Angelica Atropurpurea.</i>
HENRY A. NEWBOLD, Philadelphia, Pa.....	<i>Glycyrrhiza Glabra.</i>
JAMES J. OTTINGER, Mount Holly, N. J....	
DANIEL J. PATTON, Burlington, N. J.....	<i>Euphorbia Ipecacuanha.</i>
ROBERT F. RANKIN, Bellefonte, Pa.....	<i>Cassia Marilandica.</i>
EUGENE A. RAU, Bethelhem, Pa.....	<i>Catalpa Bignonioides.</i>
HARRY D. SCHELL, Philadelphia, Pa.....	<i>Convolvulus Panduratus.</i>
HENRY SCHMIDT, Philadelphia, Pa.....	<i>Pimpinella Anisum.</i>
LEWIS F. SEGREST, Philadelphia, Pa.....	<i>Rubus Villosus.</i>
C. F. SHOEMAKER, Philadelphia, Pa.....	<i>On Patent Medicines.</i>
WALTER C. STILLWELL, Philada., Pa.....	<i>Pix Liquida.</i>
CHARLES F. STRETGH, Salem, N. J.....	<i>The importance of System.</i>
J. L. SUPPLE, Philadelphia, Pa.....	
LEOPOLDO TOMASSEVICH, St. Jago, Cuba.....	<i>Pharmacy as one of the Learned Professions.</i>
JOHN TULL, Philadelphia, Pa.....	<i>Granular Preparations.</i>
D. H. TURNER, Towanda, Pa.....	<i>The early closing of Drug Stores.</i>

A. B. WENRICH, Myerstown, Pa.....*Pharmacy vs. Vox Populi.*
 J. ALEX. WILHELM, York, Pa.....*A Chologogue tincture of Gentian.*
 J. L. WILLIAMSON, Bethlehem, Pa.....*Rennet and its Preparations.*
 SAMUEL P. WRIGHT, Smyrna, Del.....*Suppositories.*

The report of the Committee of Conference with the medical societies was read and accepted, and the Committee discharged.

To the President of the Philadelphia College of Pharmacy.

SIR :—At a meeting of the Joint Committee of physicians and pharmacutists appointed to consider the subject of Legislation in reference to the adulteration and deterioration of drugs, held at the Hall of the College of Physicians last evening (29th inst.), the Secretary was directed to transmit to the Chairman of each Society represented in the Joint Committee a copy of the following resolutions, together with a copy of the “Draft of a proposed Law” therein referred to :

“*Resolved*, That the Joint Committee appointed by the College of Physicians, the State Medical Society, the County Medical Society, and the College of Pharmacy, respectfully advise the several bodies which they represent that, in their opinion, the draft of a law proposed and considered by the American Pharmaceutical Association embodies a better plan than any other which has been brought to their notice for the suppression of adulteration and sophistication of drugs and medicines.”

“*Resolved*, That the expression of opinion of the Joint Committee in the resolution just adopted, refers exclusively to those sections of the ‘Draft of a Proposed Law’ which relate to the adulteration and sophistication of drugs and medicines.

The above resolutions are extracted from the minutes, and were adopted by the Joint Committee as their final action in reference to the subject under consideration, after which the Committee adjourned ‘sine die.’

ALFRED B. TAYLOR,

Secretary of the Joint Committee.

Philadelphia, Dec. 30th, 1869.

Prof. Joseph Carson, M.D., was elected an honorary member, and Charles Bauer an active member of the College.

The Treasurer of the late Building Committee was directed to pay the balance to his credit to the Chairman of the Sinking Fund Committee.

The reports of Committee on revision of the Pharmacopœia, of Publication Committee and of the Committee on Latin Labels were read and accepted.

To the Philadelphia College of Pharmacy :

The Committee appointed by the College on the Revision of the United States Pharmacopœia respectfully report—

That shortly after their appointment the committee met for organization, when the general committee was divided into sub-committees, each consisting of three members. The different parts of the Pharmacopœia were apportioned amongst these committees for consideration and report. The various sub-committees have, from time to time, reported to the general committee, when their reports have been discussed and amended, and either rejected or adopted.

The subject of weights and measures has been considered, and various propositions brought forward. It has been proposed to use avoirdupois instead of troy weight. The French system of decimal weights and

measures has been proposed, and also the scheme of using parts instead of weights or measures. No change has, however, been recommended by the committee.

The committee have recommended the introduction of various new preparations, and the abandonment of some that are now official. Among those introduced are various chemical substances, extracts, solid and fluid; lozenges, ointments and suppositories. Some of the preparations now official have been transferred to the "list," among which may be specified "ether," "sulphate of cinchonia," "sulphate of quinia," "santonin" and "valerianic acid."

Improvements have been made in formulas, new tests have been introduced, and many minor changes have been made, with the view of explaining or improving processes that were difficult or unsatisfactory.

The committee are unable, at the present time, to hand in a complete report, since there are in the charge of the different sub-committees various unfinished reports; and we would, therefore, respectfully ask that our report might be adopted, and the committee be authorized to add to it such matters as they may deem proper, so as to have it completed in time for presentation to the Pharmacopœia Convention, which will meet in Washington, in May next.

ALFRED B. TAYLOR,
Chairman of Committee.

March 28th, 1870.

The Committee on Sinking Fund reported receipts to the amount of \$2,669, and that they had paid interest on mortgage of \$150, and on account of principal of mortgage of \$2,500, leaving in their hands \$19.

The annual election for officers being ordered, the following were elected:

<i>President,</i>	Dillwyn Parrish.
<i>1st Vice-President,</i>	William Procter, Jr.
<i>2d Vice-President,</i>	Robert Shoemaker.
<i>Recording Secretary,</i>	Charles Bullock.
<i>Corresponding Secretary,</i>	Alfred B. Taylor.
<i>Treasurer,</i>	Ambrose Smith.

Trustees.

Robert Bridges, M. D.,	Charles L. Eberle,	T. M. Perot,
S. S. Bunting,	James T. Shinn,	Danl. S. Jones,
John M. Maisch,	T. S. Wiegand.	

Librarian, T. S. Wiegand.

Editor, William Procter, Jr.

Publishing Committee.

Charles Ellis,	J. M. Maisch,	A. B. Taylor.
W. Procter, Jr.,	T. S. Wiegand.	

Curator, Thomas S Wiegand.

Sinking Fund.

T. S. Wiegand,	T. M. Perot,	James T. Shinn.
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On motion it was resolved that the meetings of the College hereafter be held in the afternoon at 3½ P.M.

T. S. WIEGAND, *Secretary pro temp.*

Editorial Department.

PHARMACOPŒIA CONVENTION OF 1870.—The following official notice by Dr. Wood states what institutions have notified that officer of their intention to send delegates. Doubtless others will be represented who have failed to notify the President of the appointment of their delegates.

National Convention for Revising the Pharmacopœia.—In compliance with a resolution of the National Convention for revising the Pharmacopœia, directing that the names of the delegates announced to the President of the Convention as having been appointed to attend the Convention, to meet on the first Wednesday of May next, at Washington, be made public in the newspapers and medical journals in March, the following names of delegates are now published, with the date at which their appointment was made known to the President, in the order of their announcement:

May 27, 1869. St. Louis Medical College—A. Litton, M.D., J. S. B. Alleyne, M.D.

June 6, 1869. Maryland College of Pharmacy—Wm. S. Thompson, J. Faris Moore, Louis Dohme.

June 6, 1869. Missouri Medical College—Chas. O. Curtman, M.D.

June 25, 1869. St. Louis College of Pharmacy—O. F. Potter, M.D., Hubert Primm, M.D., Eugene L. Massott.

June 25, 1869. Chicago College of Pharmacy—Albert E. Ebert, Henry Biroth, C. Lewis Diehl. Alternates—Jas. W. Mill, F. Mahla, Ph. D., Louis Strehl.

August 9, 1869. Jefferson Medical College—John B. Biddle, M.D., B. Howard Rand, M.D.

Dec. 9, 1869. Medical Society of District of Columbia—Thos. Antisell, M.D., C. H. Lieberman, M.D., B. F. Creng, M.D.

Jan. 11, 1870. Medical College of Virginia—J. S. Wilford, M.D., R. S. J. Peebles, M.D.

Jan. 20, 1870. Massachusetts College of Pharmacy—Geo. F. H. Markoe, Samuel M. Colcord.

Feb. 1, 1870. Medical Society State of New York—Caleb Green, M.D., Wm. Manlius Smith, M.D., Edward R. Squibb, M.D.

Feb. 3, 1870. College of Physicians of Philadelphia—Geo. B. Wood, M.D., Robert Bridges, M.D., H. C. Wood, M.D.

Feb. 15, 1870. College of Pharmacy of the City of New York—Wm. Hegeman, Wm. Neergaard, P. W. Bedford. Alternates—Theobold Frohwein, Augustus W. Weismann, Geo. C. Close.

Feb. 16, 1870. National Medical College (Medical Department of Columbia College), Washington—Geo. W. Dore, M.D., John C. Riley, M.D.

March 10, 1870. Medical Department of the University of Pennsylvania—Jos. Carson, M.D., Robt. E. Rogers, M.D.

March 18, 1870. Philadelphia College of Pharmacy—Wm. Procter, Jr., Prof. John M. Maisch, Alfred B. Taylor.

The following letter has been received by the President, offering the use of a hall for the meeting and subsequent sittings of the convention:

1407 NEW YORK AVENUE,
WASHINGTON, D. C., Feb. 16, 1870.

Prof. George B. Wood, M.D.

MY DEAR DOCTOR—It affords me pleasure to inform you that at a recent meeting of the faculty of the National Medical College (Med. Dept. of Columbia College, Washington), the following resolution was unanimously adopted:

Resolved, That the Dean be instructed to tender to Prof. George B. Wood, the President of the Convention to revise the Pharmacopœia, held in 1860, the college buildings for the meeting to be held in May, 1870, and to make the necessary arrangements therefor.

The building is centrally situated, in the vicinity of the principal hotels, and is well suited for the purpose.

Respectfully, your obedient servant,

JOHN C. RILEY,
Dean of Faculty of National College.

PROPOSED CONGRESS OF COLLEGES OF PHARMACY IN RELATION TO EDUCATION.—The following circular, issued by the Maryland College of Pharmacy, is deserving of attention:

At a stated meeting of the Maryland College of Pharmacy, held April 14th inst., the following resolution was unanimously adopted:

"Resolved, That a committee of five be appointed to request the several Pharmaceutical Associations of the United States to send delegates to a Convention, proposed to be held in the city of Baltimore in September next, at the time of the meeting of the American Pharmaceutical Association.

The purpose being to consult and determine upon the best uniform course of study for those learning the profession of pharmacy, and to recommend the same for adoption in the Schools of the several Associations they represent, to the end that there may be an uniform standard of qualification for all graduating in pharmacy."

BALTIMORE, April 21, 1870.

The undersigned Committee, in performing the duty assigned them, take pleasure in directing your attention to the foregoing resolution; believing that the importance of the matter in hand will commend itself to your favorable consideration, we most respectfully request you to send delegates to said Convention.

The Convention will meet at the Hall of the Maryland College of Pharmacy, and its sessions be so fixed as not to interfere with attendance at the sessions of the American Pharmaceutical Association.

The Maryland College of Pharmacy has appointed five delegates to said Convention, three of whom are professors in our College.

Be kind enough to acknowledge the receipt of this, and also notify the Committee promptly of your action in the premises.

Jos. Roberts, J. F. Hancock,
J. Brown Baxley, Jas. S. Stevenson, Jr.,
A. P. Sharp.

CHICAGO COLLEGE SCHOOL OF PHARMACY.—In the April number of the Pharmacist the Editor authoritatively announces the organization of a faculty under the auspices of the College, consisting as follows:

J. V. Z. BLANEY, A.M., M.D., Prof. of Chemistry and Toxicology.

GEORGE M. HAMBRIGHT, Pharmaceutist, Prof. of Materia Medica.

JOHN H. RAUCH, M.D., Prof. of Botany.

N. GRAY BARTLETT, Pharmaceutist, Prof. of Theory and Practice of Pharmacy.

The fees for tuition are : For matriculation, \$2 ; lectures, including all the branches taught, \$30 ; diploma fee, \$5.

This effort has our best wishes, and, seconded by the well known energy of its supporters, we have no doubt that it will prove a success. The adoption of as high a standard of preparation as possible to be practicable will be wise, especially in view of the probable changes which may arise from the proposed Congress of Colleges proposed by the Maryland College.

PHARMACY IN NEW JERSEY.—The initiative in the late movement towards organizing the pharmacutists of New Jersey appears to have been taken at Newark, N. J., by a call published in the newspapers of that city calling for a joint meeting of physicians and druggists to draft a law "to regulate the sale of poisons." At that meeting (Jan. 26th) a committee was appointed to notify all the druggists in the State of an adjourned meeting to be held at Newark on the 17th of February. At the meeting then held the Committee reported a draft of a law, based on that of the Chicago meeting. About sixty druggists were present, and the proposed law discussed, amended and approved, and a committee appointed to present it to the Legislature. This law makes a State Society a necessity. The meeting adjourned to Feb. 24th, same place, to perfect the organization of the "New Jersey Pharmaceutical Association." This was accomplished, a Constitution and By-Laws were adopted, and officers elected for the ensuing year, and the meeting adjourned to meet in Trenton March 24th, at 10½ o'clock, A.M. The meeting at Trenton took place, but at this writing we have not been informed of its results.

PHARMACY IN EUROPE.—The following information, which has been gathered from *Pharmaceutisch Zeitung* and other journals, possesses more or less interest. The law of 21 Germ., XII, created in France three pharmaceutical schools,—at Paris, at Strassburg, and at Montpellier,—for the education and examination of apothecaries of the first class. Apothecaries of the second class were examined by a *medical jury* (one being located in each department), and could establish themselves in business only in the department in which they had been examined. In the departments of Seine, Hérault, and Bas Rhin, containing the pharmaceutical schools, pharmaciens of the first class only could carry on business. The law of August 22, 1854, discontinued the *Juries Médicales* and established twenty-one preparatory schools for medicine and pharmacy, where pharmaciens of the second class are examined. These may, however, submit to an examination for the same degree at one of the pharmaceutical schools. In regard to the location of these pharmaciens, the Minister of Education, by a decree of Dec. 23, 1854, sustained the old law, but this decree was abrogated Nov. 30, 1867, by Minister of Educa-

tion Durug. After this the second class apothecaries commenced to enter business in the three cities named, which called forth a remonstrance from those of the first class, which not having effect on the Council of State, the case was taken to the Courts,—which tribunal, on the 19th of Feb., 1870, condemned six second class apothecaries to close their stores within two weeks after the publication of the decision, under a penalty of twenty-five francs for every day's delay, and to costs.

The City Council of Hymnegen, in Holland, has granted to the *Arts-enijmengkundige Vereeniging* of that city the use of the laboratory and apparatus of the High School, with an annual subsidy. The Society has opened a pharmaceutical school to prepare clerks for the States examination. The biennial course embraces pharmaceutical botany, pharmacognosy, pharmacy and toxicology.

The Swiss apothecaries are considering the revision of the *Pharmacopœia* of Switzerland; they had a meeting at Olten on the 21st of March.

The plan to establish a University in Siberia is again under consideration by the Russian authorities. Several exiles having remained in Siberia after their terms of banishment had expired, have signified their willingness to accept professorships, to submit to the requisite examinations, and to perfect themselves in the languages of that country; among them are ten *literati* who studied at German Universities, and eight priests.

The elaboration of a new edition of the *Pharmacopœia* is to be entrusted to a special committee by the Federal Council of North Germany.

A case of poisoning by prussic acid vapor occurred in a chemical manufactory at Brussels by the fracture of a bottle containing 800 grammes of the poison. He was restored by dilute chlorine water and ammoniacal embrocations. A dog in the room at the time died from the effects of the vapor inhaled.

CHEMICAL MASK.—Our attention has been called to a mask to protect the face, lungs and eyes from injury during chemical manipulations, especially in industrial processes, called Butcher's Artizan's Safety Mask and Respirator, gotten up by Mr. B. F. Butcher, of Philadelphia. It consists of a metallic mask for the upper part of the face, with glass eye-pieces. Attached to the lower portion is a silk sack, to include the chin and beard when worn. The edges of the metal have sponge sewn continuously around, projecting towards the face, and which is to be wet when the mask is worn. As this ring of sponge includes only the nose, the air inspired should be drawn through that organ, which causes it to pass through the pores of the sponge, and on this filtering action depends the value of the arrangement,—the lungs being emptied by way of the mouth. Its use is suggested for operatives in white lead factories, in powdering establishments, paper-hanging factories, where dust is the noxious agent, and in chemical works, where explosions and noxious absorbable gases are avoided.

FRENCH JUSTICE.—A Paris *pharmacien* has been subjected to a fine of one hundred francs, with costs, or to be imprisoned for forty days, as a penalty for supplying in a prescription a bottle of vin. cinchonæ of the French Codex, instead of “Seguin’s cinchona wine.” Additional to this, the unfortunate apothecary was compelled to have a copy of the judgment displayed on his door, and at the shops of nine other pharmaciens residing near him.

HONORS TO PARISIAN CHEMISTS.—M. Wurtz, chemist of Paris, has been elected Vice-President of the Academy of Medicine for 1870, and M. Bouis has been appointed to the chair of Toxicology in the Upper School of Pharmacy at Paris.

ERRATA.—Our readers are particularly requested to correct an annoying little error of the press in the article on Liquid Pepsin, by Mr. E. Scheffer, in the last number, at page 98, line 19 from top. Instead of the words, “possessing a faint and disagreeable odor,” it should read, “possessing a faint, *not* disagreeable odor.” The correction is so easily made that it should be done at once. Also, at page 134, article Sulpho-carbolate of Soda, at line 7 from top insert the words “of each” before the figures “16,” so as to read, “Take of pure crystallized carbolic acid, (Calvert’s), Sulphuric acid sp. gr. 1·84, of each 16 troy ounces.”

The Dispensatory of the United States of America, by George B. Wood, M.D., &c., &c., &c., and Franklin Bache, M.D., &c., &c. Thirteenth edition, carefully revised. Philadelphia, J. B. Lippincott & Co., 1870. Pp. 1810, octavo.

When the twelfth edition of the Dispensatory was printed the work was stereotyped, and there was every prospect that a long time would elapse before a new revised edition would be forthcoming, but so rapid has been its sale, and so much new matter has been presented demanding notice, not forgetting the second edition of the British Pharmacopœia, that the author’s well known thoroughness would not permit him to allow a further use of the plates before the work was revised; a labor of such magnitude as to have engaged him most of his time for more than a year,—not estimating the very considerable contributions towards it gradually accumulating on his hands since the previous edition issued. As the revision applies to the entire work, the additions enter into a large number of the articles, so that it is extremely difficult to give any idea of the added matter in a brief notice. Very much of this matter is in the form of footnotes, in small print.

The changes in the British Pharmacopœia have added much to this work, so many articles having been restored that were omitted in the first edition of that code. The author has spared no pains to bring in all the recent information up to the time of printing each article, and where such notices are not found it is due to the article appearing too late. Even chloral has a place in the appendix, though first announced as a hypnotic long after the printing of the book had commenced.

Although about one-tenth larger, the book is not thicker, which has arisen from the use of paper strongly calendered, so as to condense its bulk and increase its smoothness,—which, together with its clear type, will render the work increasedlly acceptable to the American apothecary and physician.

Michigan University Medical Journal, conducted by the Faculty of the Medical Department, Ann Arbor, Mich.: Monthly. March, 1870, Vol. I, No. 1, pp. 64.

This new medical monthly is placed on our list of exchanges. The managing editors are Drs. Henry S. Cheever, Preston B. Rose, Albert H. Prescott, and George E. Frothingham. The editors enter the lists in good spirits. Their number is formidable. If they can render their efforts homogeneous, and direct them to the purposes set forth in their initial editorial, they will benefit medicine, advance their institution, and reap personal honor.

In the April number, received since the above was written, Dr. Prescott has an excellent essay, entitled "Pharmaceutical Chemistry in its Relations to Medical Practice," and discusses the relations of Pharmacy to medicine. The following paragraph occurs:

"The relations which exist between the professions of medicine and pharmacy are peculiarly intimate. To a considerable extent identical preparatory studies are required for each; chemical science is fundamental to each: botany is valuable to each. The pharmacist must traverse the larger portion of the field of therapeutics and hygiene, and the physician must obtain acquaintance with pharmaceutical processes. It is true that after a time the student of pharmacy diverges upon a clearly marked path from the broader field of medicine; but when he enters the practice of his vocation, he returns to labor with the physician in every province of the healing art. The eye and the hand are not more closely connected in action than are the physician and pharmacist in the daily performance of duties for a common object."

Dr. Prescott considers this division of labor, and queries whether the responsibility is divided also? He takes the ground that in the present state of pharmaceutical practice, the physician is responsible in so far as he *can* direct his prescriptions to qualified pharmacutists, and that he will continue to be so until "the pharmacist has an independent standing as an educated expert—a standing certified by diploma upon competent authority—then the physician becomes warranted in saying, 'I am not responsible for his branch of our profession.'"

The importance of chemistry as the ground work of pharmacy is strongly urged, and, with due allowance for Dr. Prescott's predilections for his favorite science, he offers many strong arguments why pharmacutists should aim at a higher qualification and a more thorough preparation for their responsible duties.

THE California Medical Gazette continues in its March issue "The Flora of San Francisco," devoting eight pages in each number. When complete it will be an interesting contribution to the literature of botany.

The Archives of Ophthalmology and Otology. Edited and published simultaneously in English and German, by Prof. H. Knapp, M.D., in New York, and Prof. S. Moos, M.D., in Heidelberg. Vol. I, No. 1. New York: William Wood & Co. Carlsruhe: Chr. Fr. Muller'sche Hofbuchhandlung, 1870. pp. 364, octavo, with eight lithographic plates, several of them colored.

Received from the publisher just as we are closing our columns. The work is elegantly gotten up and illustrated. It consists entirely of original articles, contributed by German and American writers, and is published half yearly, simultaneously at New York, in English, and at Carlsruhe, in German. It undoubtedly possesses many claims to the attention of medical and surgical readers. Price \$7 a year.

On the Physical Basis of Life. By T. H. Huxley, LL. D., F. R. S. New Haven, Conn.: Charles C. Chatfield. pp. 35, 12mo.

This pamphlet is the reprint of a discourse originally delivered in Edinburg, November 18, 1868, and subsequently published in London in the *Fortnightly Review*. It deals with what has been called the new philosophy, in reference to organic life, and involves points of discussion which many approach with fear of a materialistic tendency to the doctrine of necessity; but the author repudiates that any such charge can be truthfully made in regard to his views. The nature of that which occurs in a single organic cell of a vegetable organism, by which carbonic acid water, and ammonia are converted into protein, or "protoplasm," as the author calls it; or in the cell of an animal organism, by which dead organic matter is converted also into protoplasm, is the question at issue. The highest organisms are but aggregates of cell action. Living matter is mineral matter under the influence of cell action. The action in an animal cell can only be sustained by the consumption of matter previously organized by cell action, whilst the vegetable cell is endowed with the power of transforming mineral into organic matter. The brain is the organ designed by the Creator to manifest intellect; it is a congeries of cells in ceaseless action. All cell action is attended by waste and growth. The act of thinking must, therefore, occasion waste, or excretion of substance, to be recuperated by growth or accretion. It therefore follows that the manifestation of thought and emotion are coincident with and dependent on cell action. But life in the cell is to us as wonderful and as inscrutable as life in a complex organism, and Almighty power as manifest in the one as the other.

The Arts, devoted to Science and Arts. A monthly journal by Joseph M. Hirsh, Ph.D., Chicago, Ill. Vol. I, No. 1; pp. 18, quarto. Price one dollar per annum.

This new enterprise, if judged by the first number, promises to be an interesting and useful publication, embracing a variety of topics. The price places it within the reach of a large number, and it merits a generous support. The frontispiece is a lithograph of the late Prof. Thomas Graham, of London.

Modern Therapeutics; a compendium of recent formulæ and specific therapeutical directions. By George H. Napheys, A.M., M.D., &c. Philadelphia, S. W. Butler, M.D., 1870; pp. 390, 12mo.

This formulary consists largely of recent prescriptions. Its groups are arranged from the therapeutical standpoint,—a feature rather unusual,—and, accompanied as they are by explanations bearing on treatment, are well calculated to prove useful to the physician in the selection of a remedy in cases where the treatment is not obvious. The prescriptions of many prominent physicians, as well at home as abroad, are presented, and give a freshness to the work that must address itself especially to the young practitioner. The price of the book is \$2.25.

Paris Universal Exposition, 1867. Reports of the U. S. Commissioners.

The progress and condition of several departments of industrial chemistry. By J. Lawrence Smith, U. S. Commissioner. Washington, Government Printing Office, 1869.

The notice already taken of the industrial products and processes of Class 44 of the Paris Exposition (see vol. _____), makes it unnecessary to say much in regard to this Report, which is chiefly devoted to the heavy branches of chemical manufactures, as sulphuric acid, soda salts, potash and its salts, chlorine products, coal tar products and saponification. The report contains much interesting information, most of which, however, has already transpired through the journals.

Half-Yearly Compendium of Medical Science. Part V. January, 1870. S. W. Butler, M.D., 115 South Seventh St., Philadelphia.

The Compendium, though rather behind time, contains the usual amount of useful information, gathered from about seventy-three different journals, and presented in nearly three hundred articles from sixty-nine American and two hundred and sixty-six foreign writers. Price \$3 per annum.

Annuaire de Therapeutique, de Matière Medicale de Pharmacie et de Toxicologie pour 1870, etc., par A. Bouchardat, Prof. d'hygiène à la Faculté de Médecine de Paris, etc. Paris, Germer Baillié, 1870; pp. 301, 18mo.

This is the thirtieth year of this useful little French annual, which makes its appearance regularly, and embraces a variety of articles of interest to the physician and pharmacist.

Letheomania; the result of the hypodermic injection of morphia (from the Pacific Med. Jour.) By Henry Gibbons, M.D.

This is a cautionary paper addressed to physicians, urging moderation in the use of this form of medication with narcotics, and especially to avoid the placing of its application in other than professional hands.

Valedictory Address to the Graduating Class at the Jefferson Medical College, by Prof. J. Aitken Meigs, at the 45th Commencement.

Finances of Pennsylvania. Report of the Auditor-General of the Commonwealth of Pennsylvania for the year ending November 30, 1869. Harrisburg, 1870. pp. 191.

Annual Address of the Hon. Charles P. Daly, LL.D., President, delivered before the American Geographical and Statistical Society, Jan. 25, 1870. New York, 1870; pp. 46.

This is a highly interesting résumé of the leading facts and discoveries relating to geographical science, giving a connected account of the various efforts recently made and making to extend the bounds of the known and well defined on the earth's present surface.

OBITUARY.

DR. JOSEPH REDTENBACHER, Professor of General and Pharmaceutical Chemistry in the University of Vienna, Austria, died in that city March 5.

On the same day and in the same city, died FRANZ BECKERT, apothecary, and Director of the Austrian Apothecaries' Society, in his 74th year.

The celebrated botanist FRANZ UNGER, born in Styria in 1800, was found dead in his bed at Graz, Austria, on the 13th of February. Having been indisposed for some time, it was supposed that he got up during the night, wounded the back of his head by a fall, went to bed again, and expired through paralysis of the brain. Subsequently foul play was suspected, and a near relative of the deceased was accused of the murder. The committee of the Vienna medical faculty, consisting of the Professors Dumreicher, Schroff and Dlauby, reported against the theory of death by violence.

FRED. JULIUS OTTO, Professor of Technical Chemistry and Pharmacy in the Collegium Carolinum at Brunswick, Germany, died there on the 12th of January last. Born in Saxony Jan. 8th, 1809, he became a pharmacist, but soon devoted himself to teaching chemistry, and in 1833 accepted a call to Brunswick, where he remained until the time of his death. In 1837 he published his first work, "On the Rational Practice of the Technical Arts;" in 1852—56 his celebrated work on Chemistry, based upon Graham's Elements of Chemistry; in 1856, "On the Detection of Poisons;" in 1857, "On the Manufacture of Vinegar." Numerous essays of his are scattered through various chemical journals. In his death pharmacy has lost one of her brightest disciples, and chemistry one of her most devoted experts.

M. FR. KIRSCHLEGER died on the 15th of November, 1869, in his 66th year, having been born on the 6th of January, 1804, at Munster (Haut Rhin). He was apprenticed to M. Suffert, of Ribeauville, as a pharmacist. He also studied for some time with M. Charles Nesler, Prof. of Botany and Pharmacien-in-Chief of the Civil Hospitals. In 1827 he went to Paris, and in 1828 sustained his thesis for the Doctorate. In 1834 he established himself at Strasburg, and afterwards became Professor of Botany at the School of Pharmacy there.

The works of M. Kirschleger are chiefly botanical, and include a prodromus of the Flora of Alsace. In 1852 he commenced the publication of the Flora of Alsace, and continued it through several volumes.

THE
AMERICAN JOURNAL OF PHARMACY.

JULY, 1870.

THE CONVENTION FOR THE FIFTH DECENNIAL REVISION
OF THE PHARMACOPŒIA OF THE UNITED STATES.

The fifth decennial convention to revise the Pharmacopœia of the United States, met in the hall of the National Medical College, Washington, D. C., on Wednesday, May the 4th, at 10½ o'clock, A. M.

On motion of Dr. Miller, Secretary of the Convention of 1860, Dr. Carson, of Philadelphia, was called to the chair, and Dr. John C. Riley, of Washington, chosen Secretary *pro tem*.

Dr. Miller moved that a committee of five be appointed to nominate permanent officers of the Convention, which was passed, and the chair appointed Dr. Squibb, of New York; Dr. Ruschenberger, United States Navy; Mr. Colcord, Massachusetts; Dr. Geo. M. Dove, Massachusetts, and Dr. Jenkins, Kentucky.

Dr. Howard, of the District of Columbia, moved that the chair appoint a committee of credentials, to consist of five, which was carried, and the chair announced the committee as follows: Dr. F. Howard, District of Columbia; Mr. Procter, Philadelphia; Dr. R. Amory, Massachusetts; Mr. Ebert, Illinois, and Dr. Maddux, Maryland.

The committee reported the following delegates as duly accredited to this Convention: St. Louis Medical College—A. Litton, M. D., J. S. B. Alleyne, M. D. Maryland College of Pharmacy—W. S. Thompson, J. Faris Moore, Louis Dohme. Missouri Medical College—Charles O. Curtman, M. D. St.

Louis College of Pharmacy—O. F. Potter, M. D., Hubert Primm, Eugene L. Massott. Chicago College of Pharmacy—Albert E. Ebert, Henry Biroth, C. Lewis Diehl. Jefferson Medical College—John B. Biddle, M. D., B. Howard Rand, M. D. Medical Society District of Columbia—Thos. Antisel, M. D., C. H. Lieberman, M. D., B. F. Craig, M. D. Medical College of Virginia—J. S. Welford, M. D., R. S. J. Peebles, M. D. Massachusetts College of Pharmacy—Geo. L. H. Markoe, Samuel M. Colcord. Medical Society of New York—Caleb Green, M. D., William Manlius Smith, M. D., Edward R. Squibb, M. D. College of Physicians, Philadelphia—George B. Wood, M. D., Robert Bridges, M. D., H. C. Wood, M. D. College of Pharmacy of City of New York—William Hegeman, William Neergaard, P. W. Bedford. National Medical College—Geo. M. Dove, M. D., Jno. C. Riley, M. D. Medical Department University of Pennsylvania—J. Carson, M. D., Robert E. Rodgers, M. D. Philadelphia College of Pharmacy—William Procter, Jr., John M. Maisch, Alfred B. Taylor. College of Pharmacy of Baldwin University—Martin V. B. Clarke, M. D., Robert D. Murray, M. D. Medical and Chirurgical Society, Louisville, Ky.—Dr. Thomas E. Jenkins. Baltimore Medical Association—Dr. T. Clay Maddux. Medical Department, Georgetown College—Dr. F. Howard, Dr. J. E. Morgan. War Department, Washington, D. C.—Chas. Smart, Surgeon. Navy Department, Washington, D. C.—W. S. W. Ruschenberger, M. D. Washington University, Medical Department, Baltimore—Harvey L. Boyd, M. D., Jas. E. Lindsay, M. D. Massachusetts Medical Society—Dr. S. A. Greene, Dr. Robert Amory, Dr. John Borland. Maine Medical Association—Dr. Henry T. Cummings. Medical Department University, Buffalo—Charles A. Lee, M. D. Medical and Chirurgical Society, Maryland—Dr. W. J. C. Dubamel. Baltimore Medical Association—Dr. J. R. Uhler.

Dr. E. Lloyd Howard, of Baltimore, and Dr. Thos. Miller, of District of Columbia, were invited to take seats in the Convention and to participate in its deliberations.

On motion of Dr. H. C. Wood, of Philadelphia, it was—

Resolved, That such members of Congress of the two Houses as are

graduates of regular medical schools shall be invited to attend the meetings of the Convention and participate in its deliberations, and also the Surgeon General, U. S. A., and Chief of Bureau of Medicine and Surgery, U. S. N.

The committee to nominate permanent officers, reported as follows: President, Dr. Joseph Carson, Philadelphia; Vice-Presidents, Dr. Thos. Miller, Washington, D. C., and William Procter, Jr., Philadelphia; Secretary, Dr. John C. Riley, Georgetown, D. C.; Assistant Secretary, Dr. Jas. M. Morgan, Washington, D. C.

The committee recommended that the Convention direct the Secretary to employ a stenographer to note the proceedings; which report was unanimously adopted.

[Owing to the constant engagement of the stenographic reporters at this time the Secretary was unable to procure one for the service of the Convention.—EDITOR.]

Dr. Carson, on taking the chair, expressed his thanks to the body in a few touching and impressive remarks, and announced that the Convention was ready to proceed to business.

Alfred B. Taylor submitted the report of the Committee of Revision and Publication of the United States Pharmacopœia for 1860; which was accepted.

The President then called for written contributions from societies, toward the revision of the Pharmacopœia, when the following were presented: Albert E. Ebert, from the Chicago College of Pharmacy; H. C. Wood, M. D., from the College of Physicians, Philadelphia; Wm. Hegeman, from the New York College of Pharmacy; Alfred B. Taylor, from the Philadelphia College of Pharmacy; J. Faris Moore, from the Maryland College of Pharmacy; which were referred to a committee of five to report a plan for the revision of the Pharmacopœia.

On motion of Dr. Lee, it was ordered that all societies not prepared to report have permission to hand in their reports to the Committee of Revision.

The President announced the following as the committee to report a plan to revise the Pharmacopœia: Dr. Robert Bridges, William Procter, Jr., S. M. Colcord, and Drs. Walford and Lee.

The Convention then adjourned to 10 o'clock to-morrow morning.

SECOND DAY.

The Convention was called to order at 10 A. M., by Dr. Carson, the President, and the minutes of the preceding day were read and approved.

Dr. Howard, from the Committee on Credentials, reported the following additional delegates: Wm. K. Bowling, M. D., University of Nashville, Tenn.; S. C. Chew, M. D., University of Maryland; Silas L. Loomis, M. D., and Charles B. Purvis, M. D., Howard University Pharmaceutical College; Frederick Horner, Jr., University of Virginia; Chas. H. Thomas, Woman's Medical College, Philadelphia.

The chair presented a communication from the Missouri Medical College; which was referred to the Committee on Revision.

Dr. Lee, from the Committee to Report a Plan to revise the Pharmacopœia, submitted the following report:

The committee appointed with instructions to report a plan for the revision of the United States Pharmacopœia for the year 1870, would respectfully report that they recommend the following resolutions for adoption by this Convention:

1. *Resolved*, That a Committee of Revision and Publication be appointed, to consist of fifteen members, including the President of this Convention as one, to which shall be referred all communications relating to the revision of the Pharmacopœia, and three members shall form a quorum.

2. *Resolved*, That this committee shall meet in the city of ———, and be convened as soon as practicable by the President of the Convention for final organization.

3. *Resolved*, That the committee shall be authorized to publish the work after its revision and to take all other measures that may be necessary to carry out the views and intentions of the Convention.

4. *Resolved*, That if, in the judgment of the Committee of Revision, it should become necessary before the meeting of the Convention of 1880 to revise its labors, it is hereby authorized to publish a new edition.

5. *Resolved*, That the expenses of the Committee of Revision shall be paid from the income of the copyright.

6. *Resolved*, That measures of capacity be abandoned in the Pharmacopœia, and that the quantities in all formulas be expressed both in weights and in equal parts by weight.

7. *Resolved*, That in the revision of the officinal list and formulas the wants of the medical profession in all parts of the United States should

be considered in reference to local peculiarities in climate and population, and for these reasons that the scope of the work be rather extended than abridged.

8. *Resolved*, That the Committee of Revision shall have power to fill their own vacancies.

9. *Resolved*, That after the completion of its labors the committee shall transmit a report of its proceedings to the Secretary of this Convention, to be laid before the next Convention.

10. *Resolved*, That the fourteen remaining members of the Committee of Revision and Publication be selected by a nominating committee, formed of one delegate from each institution represented in this Convention, and of one from the army and navy, respectively, to be appointed by the President.

The report was accepted, and on motion the resolutions were considered *seriatim*.

Dr. Amory, of Massachusetts, offered the following amendment to the first resolution: to strike out the three last words, "form a quorum," and insert "be selected as a sub-committee, who shall report their revision before publication from time to time to the general committee, to be approved or amended, as they may determine;" which was rejected.

Dr. Loomis, of the District of Columbia, moved to strike out "fifteen members," and insert "one from each State represented;" which was rejected; and the resolution as reported by the committee was adopted.

Mr. Colcord moved to fill the blank in the second resolution by inserting "Philadelphia;" which was agreed to; and the resolution was adopted.

After a very interesting discussion the remaining resolutions were adopted without amendment.

[The first resolution called forth much discussion, great difference of opinion existing as to the number that should be appointed, it having been shown by experience that, practically, the work is done by the central members, at the place of publication. Having a paid editor, as in the case of the Brit. Pharm., was suggested, and also a working sub-committee, who should report to a session of the whole committee for its final approval; but the resolution passed as offered.

The 2d, 3d, 4th and 5th resolutions passed without much dissent. The sixth resolution, in reference to the abolition of the use of measures of capacity in the formulas of the Pharmacopœia, was discussed freely, advocated and opposed. Two of the Colleges had asked for the passage

of such a resolution, and those who advocated it were of the opinion that the use of measures of capacity by Physicians in prescribing might be continued if they desired it. It was believed that the use of weights in all cases would add to the accuracy and increase the convenience of laboratory operations, and especially in the fluid extracts and such preparations as require evaporation to a given extent.

The *seventh* resolution, relative to the scope of the Pharmacopœia, was passed by a decisive vote after considerable discussion, showing that the view of the Convention was opposed to contracting the *Materia Medica* list.—EDITOR A. J. Ph.]

Dr. Manlius Smith, of N. Y., offered the following as an additional resolution :

11. *Resolved*, That this committee are authorized to investigate any new medicine that may be brought forward in the future, and devise formulas for the appropriate preparations of it, and to publish such formulas in the *American Journal of Pharmacy*, and that these formulas shall thenceforth be considered official.

Dr. Squibb moved to strike out the words "*American Journal of Pharmacy* ;" which was carried.

Dr. Loomis moved to strike out the words "in the future ;" which was agreed to, and the resolution, as amended, was adopted.

Dr. Horner, of Virginia, moved the following :

Whereas the abuse of medicines, the vehicle of which is alcohol, has proved injurious to the health of the community ;

Resolved, That the Convention for the revision of the Pharmacopœia consider the expediency of reducing the number of alcoholic preparations. [This resolution was not acted on.]

The delegates from the various institutions represented were then called upon to name one of their number to serve on the nominating committee, and the following were announced: Maryland College of Pharmacy, William S. Thompson ; Chicago College of Pharmacy, Albert E. Ebert ; Medical Society of the District of Columbia, B. F. Craig, M. D. ; Medical College of Virginia, J. S. Welford, M. D. ; Massachusetts College of Pharmacy, S. M. Colcord ; Medical Society of New York, Caleb Green, M. D. ; College Physicians, Philadelphia, R. Bridges, M. D. ; College of Pharmacy City of New York, William Hege-man ; National Medical College District of Columbia, John C. Riley, M. D. ; Medical Department University of Pennsylvania, Joseph Carson, M. D. ; Philadelphia College of Pharmacy, Wil-

liam Procter, Jr.; College of Pharmacy, Baldwin University, R. D Murray, M. D.; Medical and Chirurgical Society, Dr. T. E. Jenkins; Baltimore Medical Association, Dr. Uhler; Medical Department of Georgetown College, D. C., Dr. F. Howard; War Department, Dr. Smart; Navy Department, Dr. Ruschenberger; Massachusetts Medical Society, Dr. Amory; Maine Medical Association, Dr. H. T. Cummings; Buffalo University, New York, Dr. Charles A. Lee; University of Nashville, Dr. William K. Bowling; University of Maryland, Dr. S. C. Chew; Howard University of the District of Columbia, Dr. Silas L. Loomis; Women's Medical College, Philadelphia, Dr. Charles H. Thomas.

A recess of thirty minutes was taken to enable the committee to meet.

The committee, on reassembling, reported the following names as the Committee for the Revision of the Pharmacopœia, in addition to the Chairman, Dr. Carson:

Dr. G. B. Wood, Alfred B. Taylor, John M. Maisch, Dr. Robert Bridges, Philadelphia; Dr. Edward R. Squibb, New York city; Albert E. Ebert, Chicago, Ill.; J. Faris Moore, Baltimore, Md.; G. F. H. Markoe, Boston, Mass.; Dr. John C. Riley, Washington, D. C.; Dr. Thomas E. Jenkins, Louisville, Ky.; Dr. Chas. A. Lee, Buffalo, N. Y.; Dr. J. S. Wellford, Richmond, Va.; Wm. F. Wentzell, San Francisco, Cal.; W. S. W. Ruschenberger, for U. S. Army and Navy, Philadelphia.

The report was accepted.

Dr. Squibb tendered his resignation as a member of the Committee of Revision, which was reluctantly accepted, and Dr. W. Manlius Smith, of New York, was elected to fill the vacancy thus created.

Prof. J. M. Maisch also offered his resignation, owing to pressure of other duties, but the Convention being disinclined to accept it, he acquiesced in the appointment.

Dr. Loomis, of Washington, moved that the rules adopted by the Convention of 1860 for the meeting in 1870 be adopted for the Convention in 1880, simply changing the dates; which motion was unanimously adopted.

Dr. B. F. Craig, of Dist. of Columbia, offered the following:

Resolved, That the Committee of Revision be instructed to include some part of the metrical system in the list of official weights and measures.

The resolution was adopted, after a prolonged discussion, which did not give indication of a disposition to adopt the metrical system in the Pharmacopæia at present.

Mr. Procter, of Philadelphia, offered the following, which was unanimously adopted :

Resolved, That the thanks of this Convention are due to the Faculty of the National Medical College of the District of Columbia for the use of their building for the purposes of the Convention.

The Convention, at 5 P. M., adjourned *sine die*.

ON SUPPOSITORIES.

BY HERMAN KOCH.

As the application of medicinal substances in the form of suppositories seems to be growing in public favor, I beg leave to make a few suggestions for the benefit of such practitioners as are not supplied with metallic moulds, and may not possess facilities for obtaining the same. The following plan for obviating the use of the latter which I have followed for some time, gives a product of uniform size, shape and weight, and besides being cheaper than metallic moulds, possesses the additional advantage of never spoiling the product by splitting or detaching pieces from the sides.

This is my plan : Take a piece of soft wood cut in the rounded conical shape of a suppository, allowing a portion of the wood in the centre to extend beyond the larger end as a handle ; roll a small square piece of waxed paper around the cone-shaped end of same, slanting off toward one of the corners. Secure the latter by a drop of mucilage, and the point by a vigorous twist between the fingers. Remove the paper and lay aside until the mucilage is dry, then reinsert the wooden cone, mark edge of same on the paper by encircling closely between thumb and forefinger, and lastly trim off close to said edge with a sharp knife. Keep the moulds thus formed in a cigar box, the lid of which has been perforated with two or three rows of small

round holes, which will serve to keep them in a vertical position when used. I generally keep on hand three sizes of moulds, holding respectively one, two and three scruples, and mark the wooden cones accordingly. These moulds cannot be used more than once, but can be so readily reproduced that this is scarcely a disadvantage.

Cincinnati, May, 1870.

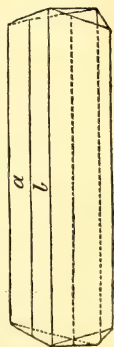
VACCINIIN, A CRYSTALLIZABLE PRINCIPLE EXTRACTED FROM THE LEAVES OF THE COW BERRY (*VACCINIUM VITIS IDÆA*, L.)

By E. CLAASSEN, Apothecary.

Already in the year 1865, before emigrating to this country, I prepared in Germany this crystalline substance from the plant above named. This plant, so common in Europe, grows in but few places of the Northern United States, particularly in the higher mountains of the New England States.

By boiling the fresh plant with water and quick lime, precipitating the decoction with acetate of lead, filtering, treating the liquid with sulphuretted hydrogen, again filtering, evaporating to the consistency of syrup, and allowing the product to stand for several days, it assumes the form of a crystalline jelly, which being placed upon linen, so as to let the mother-liquor drain off, and then pressed, yields nearly colorless crystals, which are purified by dissolving them in boiling water, treating with animal charcoal, and crystallizing. The amount of vacciniin in the shrub is about 1 per cent. It forms long acicular crystals, of a somewhat bitter taste, and without any smell. In general, many of the crystals are united, forming fascicles, but sometimes you may see them in the shape of four or six-sided (probably rhombical) prisms, with two sides, flattening their ends.*

It is scarcely soluble in ether, pretty easily soluble in cold water and alcohol, but very easily in boiling



* The sides represented by *b* are often so predominant as to be three times as large as those represented by *a*.

water, so much so that the latter, having been saturated with vacciniin, after cooling yields a solid mass.

Heated, it melts to a clear liquid, reduced to coal by stronger heat. Neither subacetate of lead nor tannin render any precipitate. Its reaction on litmus paper is neutral. The vacciniin also contains no nitrogen, for, melted with hydrate of potash, it produced no ammonia. Its elements will be, therefore, carbon, oxygen and hydrogen.

All these properties make me believe that it belongs, like arbutin, to the so-called "bitter substances."

TINCTURA NUCIS VOMICA.

To the Editor :

Dear Sir,—Having occasion to make Tr. Nux Vomica not long since, I made it in the usual way, according to the Pharmacopœia—4 troyounces nux vomica to a pint of alcohol, using alcohol sp. gr. 0.835. I discovered something which I never saw or even heard anything of before. The subject is worth a little notice here, and the readers of the Journal may hear of something that will interest them, and throw light on the subject, in case they ever meet with the same. After making the tincture, I placed it away in its proper place. About two weeks after, I had occasion to use it, and was surprised to find deposited in the bottom of the bottle small, almost colorless crystals, octahedral in shape. Not knowing what they were, but judging from their appearance they were strychnia, I proceeded at once to examine them, being anxious to know what they might be. I filtered the tincture, and collected the crystals on a filter, dried and weighed them, and found them to weigh 3 grains. I applied the bichromate potash ($\text{K}_2\text{Cr}_2\text{O}_7$) and sulphuric acid (H_2SO_4) test, which produced that purplish color characteristic of strychnia. I also examined it for brucia, and found it to give the faintest red color, using the nitric acid (HNO_3) test, thus proving that the crystals were nearly pure strychnia with a small quantity of brucia. Having some of the nux vomica left, I made an infusion with part of it, in order to find whether the nux vomica was alkaline or not, and found it to be decidedly so, using curcuma paper, turning it brownish ; it

also restored litmus paper after being reddened by sulphuric acid (SO_3). The cause of the formation of these crystals I believe is due to the alkalinity of the nux vomica. I had a very small quantity left, and examined it to see the amount of strychnia present, and found it to contain about 2 per cent., thus proving that the specimen was very rich in strychnia.*

Yours respectfully,

GEO. W. KENNEDY.

Pottsville, Pa., May 16, 1870.

PHARMACEUTICAL NOTICES.

Chlorinated Lime.

Editor of the American Journal of Pharmacy:

Sir,—Every druggist has been more or less annoyed by his chlorinated lime getting moist (quite semi-fluid sometimes), and consequently unsaleable.

Allow me to recommend (after six months' trial) to keep the lime in *Whitall's patent fruit jars* (410 Race st., Phila.) The lid is made to close air-tight, being kept down on a gum elastic ring by means of a clamp and screw. I filled a jar six months ago, and opened it daily, in order to expose the chlor. lime to the air as much as that kept in the usual way. I found it two weeks ago nearly as dry as when I filled it in, and the smell just as strong. I think the same class of jars would be just the thing to keep carbon. ammonia in.

These jars are to be had in three sizes, viz., pints, quarts, half-gallons—sufficiently large for the quantity daily sold.

* The author does not say to what the alkalinity of the nux vomica was due, but leaves us to infer that it was owing to the strychnia. As strychnia only occurs in the saline state, it is probable that the particular lot of nux vomica treated had previously become mixed, accidentally, with alkaline matter (potassa, soda, or ammonia) before he bought it, which displaced the strychnia and brucia. The greater solubility of the latter will readily account for its absence from the crystals. If the author has any of the drug left, he might verify or disprove this suggestion.—EDITOR AMER. JOUR. PHARM.

Extemporaneous Drop Machine.

I have for some time been using the following method in "dropping," and gaining thereby uniformity in the size of drops (of the same liquid) I think it is worth a corner in your Journal, so much the more as every druggist has the machine at hand.

I simply take a *half ounce glass* measure (graduated), measure off *one drachm* of the liquid, and drop from the measure. Every druggist has at least a *one ounce* measure. In always dropping from the *same measure* from a *same quantity of liquid*, uniformity will be insured.

For obvious reasons the above method cannot well be applied to the dropping of essential oils.

Very respectfully yours,

H. M. W.

Philadelphia, May 26, 1870.

NOTE TO HAIR DYE, (page 227 of *May No.*)

Cairo, Ill., May 4th, 1870.

EDITOR JOURNAL OF PHARMACY, PHILADELPHIA :

I saw this evening, for the first time, a notice from a party in New York who manufactures an article which he calls "Egyptian Hair Coloring," cautioning persons who buy "hair-restorers," to have their druggists first test them for lead and mercury by means of potassa iodide, and as the preparation mentioned in the article I sent you last month possesses the property of not yielding a precipitate on the addition of that salt, you would oblige me, if it is not too late, by adding to or inserting in the article in question the remarks enclosed with this note.

Yours respectfully,

GEO. McDONALD.

(The reader will consider the following in connection with page 227 of the May number, it having arrived too late for the May number.)

This preparation has the singular property of not indicating the presence of lead on the addition of iodide of potassium. When iodide of potassium is added to a solution of the ordinary salts of lead, a bright yellow precipitate of *iodide of lead* is immediately formed, but when added to this preparation, no change whatever ensues. *The reaction is completely masked.* Sulphuric acid, however, readily indicates the presence of the poison, by the formation of a heavy, white, insoluble precipitate of sulphate of lead.

NOTE ON IMPURITY IN TR. CHLORIDE OF IRON.

EDITOR OF THE AMERICAN JOURNAL OF PHARMACY:

Dear Sir :—In the May number of your Journal of Pharmacy is a communication from Dr. Robert Battey, in answer to a previous one from myself, upon the subject of an impurity in tincture of iron.

He states that the silky white needles that constitute the impurity above mentioned, when tested before the blow-pipe and also by the wet-way, give the characteristic reactions of *sulphate of lime*.

From what I had said upon the subject in the March number of the Journal of Pharmacy, it would naturally have been inferred that the substance in question was some one of the salts of lime, and, in fact, I ventured the conjecture that it was a *silicate* of that base, but did not investigate the matter sufficiently to decide upon its *acid* constituent, as I believed it to be from the glass.

I am happy to acknowledge the correctness of Dr. Battey's opinion, and agree with him that it is doubtless *sulphate of lime*, and as there is some apparently contradictory views between us I will say that both may be made fully to coincide in most particulars. I stated that my conviction was that the impurity arose from the action of the acid upon the glass vessel, and Dr. B. thought that it existed in the acid employed. In order to decide the matter I tested my acid (the same as I had used in preparing the tincture of iron when the crystals were produced.) I found that it contained *sulphuric acid* in a small proportion, but *no lime*.

Now it is plain that if *commercial muriatic acid* be employed, *sulphuric acid* will be a more *probable* impurity than sulphate of lime, but in either case the latter substance may be found in the tincture prepared from such acid. If sulphate of lime *does* or *does not* pre-exist in it, when the mixture is heated the sulphuric acid will act upon the glass and form sulphates of lime, potassa and soda, the former of which will remain dissolved with the rest while the solution is warm ; but will crystallize out on cooling.

I am sure that the reaction is generally that of the acid upon

the glass, as I before stated, and the apparent different modifications of the impurity may be caused by the different percentage of acid from which the crystals are deposited. Concerning the yellowish deposit, I am not certain that there is a necessary connection between it and the sulphate of lime; but the precipitation of both must have been *simultaneous* in the case I wrote about.

Yours very truly, J. C. WHARTON.

Nashville, Tenn., June 11th, 1870.

SYRUP OF SENEKA.—CORRECTION.

TO THE EDITOR AMERICAN JOURNAL OF PHARMACY:

Dear Sir:—In my article on "Syrup Seneka," in the last number (May) of this Journal I discover *three* typographical errors, one of which, being in the body of the formula, it is important to correct, viz.: at page 229, in the formula, instead of "White Sugar, in coarse powder, *four* troyounces," it should read "White Sugar, in coarse powder," *nine* troyounces; and at page 230, line 35 from top, I am made to say "I have *varied* that preference in this instance," instead of "I have *waived* that preference in this instance;" also at page 231, line 23 from top, the word *serves* is inserted instead of the word *seems*, as in the manuscript. Will you, therefore, be good enough to give this note a place in your valuable, and usually correct and reliable Journal, and oblige

Yours respectfully,

J. B. MOORE.

June, 1870.

ON UNGUENTUM HYDRARGYRI OXIDI RUBRI.

BY HENRY A. BOWER.

All pharmacutists, I presume, have been annoyed (and that, too, at a time when it was most inconvenient to make this ointment up fresh) to find (when wishing to use it) instead of a fine red color, it had changed, chameleon like, to an olive-green or black.

Long time ago I adopted the following formula, and have communicated it verbally to others, and my eyes have always been gladdened since to find it retain a rich brilliant salmon color, and I can safely say I have found it never loses its beautiful redness :

R

Red Precipitate,	.	.	.	3x
Castor Oil,	.	.	.	f3i
Lard,	.	.	.	3vii Troy
Yellow Wax, opt. (orange color)	.	.	.	3ii "

M.

Melt the wax and the lard together and mix with the castor oil. On cooling, add the red precipitate in *very fine powder*, stirring constantly with a wooden spatula until cold.

Philadelphia, June 13th, 1870.

PHARMACEUTICAL LEGISLATION.

BY JOHN M. MAISCH.

There is at the present time no civilized country, outside of the North American continent, in which the practice of medicine and of pharmacy is not regulated, at least to a certain degree. Throughout Europe and in the more populated districts of South America, a certain qualification is required of the pharmacists before they are allowed either to take the position of assistants or to assume the entire control of a pharmaceutical establishment. That the standard of qualification required in the various States must of necessity be very different, may be inferred from the political, commercial, and industrial history of these countries, and the general intelligence of their law-makers. It is not our purpose to criticise the various laws ; it is sufficient to point to the fact that, aside from the restrictions placed upon the opening of new establishments, which are usually based upon a certain ratio of population, and aside from certain police regulations, the great aim of the laws in all cases is to secure a certain qualification ; and the higher this standard, the greater the security of the public against malpractices in every shape and form on the part of the pharmacist. No drug examiner—and if

one was appointed for every store—could increase that security which is afforded by professional integrity, based upon a thorough qualification.

Opinions may differ in regard to the proper means to secure it; the machinery proposed by the American Pharmaceutical Association may be somewhat unwieldy and cumbersome; it has already been simplified by the New Jersey Pharmaceutical Association, and Baltimore has secured a law which, if carried out in spirit, is well adapted to farther build upon.*

With an experience of nearly two hundred years,† Prussia has continually endeavored to raise the standard of qualification of her apothecaries, and to educate them in accordance with the progress of science. Since the establishment of the North German Confederation under the guidance of Prussia, it has become necessary to harmonize the laws existing in the various smaller States, and accordingly it is contemplated to issue new laws for the government of practitioners of medicine and of pharmacy. The latter subject has been entrusted to a committee of prominent pharmacists of Northern Germany, who have adopted the draft of a law to regulate the practice of pharmacy in that country (*Apotheken-Ordnung*), which has been published in the German pharmaceutical periodicals, and from which we extract and condense that portion which is most interesting for this country,—the sections on the education (*Ausbildung*) of the apothecary, and on the right to conduct a store:

§ 14. An approbated apothecary only can be principal of a pharmaceutical establishment (*Apotheken-Vorstand*).

§ 15. The owner of the officine‡ shall also be the principal; in certain cases (provided for in the law), however, a lessee or agent (administrator) may be principal.

* In January last a pharmacy and poison law was passed and approved in Rhode Island, which in its main features is identical with the draft recommended by the Amer. Pharm. Assoc., but considerably simplified.

† The first apothecary law in Prussia was promulgated in 1693.

‡ We propose to use the word officine in this paper for pharmaceutical establishment. The Latin *officina* has been adopted in the French (*l'officine*) and the German (*Officin*) languages, and is undoubtedly more expressive for a complete pharmaceutical establishment than either apothecary's shop or store, and also more than office in the popular usage of this word.

§ 16. An apothecary who, for five years, has neither conducted an officine nor acted as assistant, must, previously to becoming principal, prove his capability by another examination.

§ 19. No apothecary can own two or more separate officines; on acquiring the ownership of a second officine the provisions of § 17 apply to him, except the right to lease it to another (*i. e.*, he must appoint a qualified principal at once, and sell the business within a year). Neither can an apothecary conduct two or more officines at the same time.

§ 20. An officine may be owned by two or more persons, qualified to be principals, of whom, however, one only can be the responsible principal.

A. *The apprentice.*

§ 25. Every principal may employ apprentices and assistants; the right to have the former may under certain circumstances be forfeited (§ 38).

§ 26. The number of apprentices in each officine may exceed one only the number of assistants; principals not employing an assistant may have one apprentice.

§ 27 establishes the educational requirements of the apprentice, and § 28 the legal steps to be taken before entering upon the apprenticeship.

§ 29. The duration of the apprenticeship is three years; an abatement of six months may be granted by the district apothecary (*Physikats-Apotheker*) to those only who previous to entering upon the apprenticeship have attained the qualifications requisite for attending the University.

§ 30. The preceptor is charged with the instruction of his apprentices by practical precepts and exercises in technical pharmacy, and by thorough theoretical teaching of pharmacy and its collateral sciences, for which purpose he must be supplied with appurtenances commensurate to the requirements of science. Apprentices shall not be employed for services not connected with the apothecary business; aside from the daily labor, they must have sufficient time for private study, and, during summer, for botanical excursions; the preceptor has to insist on the preparation by the apprentice of a systematic herbarium of the plants collected by him. He shall also require the apprentice to keep a journal of all preparations made by the pupil, under the direction of the preceptor or his assistant (for which special opportunity must also be afforded for the purpose of instruction), and to enter therein a short description of the operations and the theory of the chemical process.

§ 31. At the termination of his apprenticeship to the satisfaction of his preceptor, the apprentice is to be reported to the district apothecary for examination.

§ 32. The examination for assistant, at which the preceptor is entitled to be present, takes place before a commission consisting of the district apothecary and district physician.

§ 33. The assistant's examination is to be practical and verbal. (a.) The main aim of the practical examination is to determine whether the functions of an assistant may be entrusted to the examinant, who has to read three prescriptions for different medicines, to prepare the same correctly, and to price them (according to the legal valuation, denominated "tax"); also to prove his ability for the practical labors of the laboratory. (b.) The verbal examination begins with the examination of some drugs and chemical preparations for their pharmacological determination, and of a number of fresh or dried indigenous plants for their recognition and terminological demonstration. The examinant shall then translate at least two paragraphs from the Pharmacopœia (which is published in Latin). This is to be followed by the examination in the fundamental principles of botany, natural philosophy and pharmaceutical chemistry, and finally in the legal enactments concerning the duties, &c., of pharmaceutical assistants.

§ 34. The entire examination is to be completed within one day; as a rule, the verbal examination shall not exceed the time of three hours.

§ 35 directs the keeping of minutes of the examination, and in case of disagreement of the members of the commission, to submit the case to the decision of a superior authority.

§ 36. The examinant is responsible for the expenses connected with the examination; each member of the commission receives three thalers, besides travelling expenses.

§ 37. Each failure to pass the examination entails a prolongation of the apprenticeship for six months, after which another examination may take place; those not passing the third examination will not be admitted to another.

§ 38. Should the preceptor be responsible for the insufficient knowledge, he will have to pay the costs of the examination, and may be deprived of the right to employ apprentices.

B. *The Assistant.*

§ 39. The testimonials of the preceptor and examination commission entitles the holder to act as assistant in any officine of Northern Germany.

§ 40. Assistants qualified in Southern Germany have the same privilege; foreigners must have previously passed the prescribed examination.

§ 41. The terms of engagement depend on the agreement between principal and assistant.

§ 42 refers to the mutual relations of principal and assistant.

§ 43. If empowered by the principal, or in his temporary absence (if over a week, the district apothecary has to be notified), the assistant may act as the representative of the principal. The latter is directly responsible; the former shares this responsibility, and is only free from the same if the act has been done by direct order of the principal.

§ 44. At the expiration of the engagement, the principal shall give a certificate to the assistant.

§ 45. The certificate is to be countersigned by the district apothecary, who likewise decides in cases of complaint.

§ 46. An assistant has to serve as such at least three years, two of which must have been spent in German officines.

§ 47. After this time, an assistant has to study the pharmaceutical sciences at a German University for at least two courses (semesters).

§ 48. To matriculate at the University, the pharmacist has to comply merely with the conditions applicable to students of whom a maturity testimonial is not required.

• C. *The Pharmaceutical State's Examination.*

§ 49. The State's examination may take place before the examination commission of any North German University. This commission consists of a physicist, a chemist, a botanist and two pharmacists, appointed by the Chancellor of the Confederation.

§ 50. Applications for examination during the summer session must be made in April, and during the winter session in November; they must be accompanied, among other certificates, by the testimonials of apprenticeship, clerkship, and attendance at University; also by a short autobiography.

§ 51. The examination consists of the course and of the final examination. Those only having passed the former can be admitted to the latter.

§ 52. The course examination is as follows: (a,) compounding of a prescription; (b,) making of two pharmaceutical preparations; (c,) writing, in clausure, of an essay on a chemical and its mode of preparation; (d,) the same on a subject of analytical chemistry; (e,) a qualitative and a quantitative analysis; (f,) a forensic analysis for the detection of an inorganic poison; (g,) verbal examination on (1) botany, (2) pharmacognosy, (3) pharmaceutical chemistry, (4) toxicology, (5) pharmaceutical laws.

§ 53. The final examination, which is to be verbal and public, and to which not more than four candidates are to be admitted at one time, comprises general and special botany, general chemistry in connection with mineralogy, and natural philosophy.

§ 54 prescribes the keeping of minutes and the judgment (censur) on each branch, as well as the general censure.

§ 55. The voting takes place by using the terms (1) excellent, (2) very good, (3) good, (4) bad or insufficient. As final censure, the first grade (excellent) can be given only on the candidate having attained in all branches at least the censure "very good;" the second grade (very good) only if the majority of the special censures were "very good."

§ 50. Repetitions of special examinations are admissable only according

to the regulations of the Federal Medical Council. The censure "bad" or "insufficient" makes a repetition of the examination necessary after at least six months; failing to pass after two postponements (three examinations) is regarded as a definitive rejection.

§ 57. Immediately after the final examination, the final censure on the entire State's examination is determined, and the chairman reports the entire proceedings, including the documents of application and admission, to the Federal Medical Council.

§ 58. Based upon the successful passing of the States examination, the federal medical council issues to the candidate the certificate of qualification (approbation) requisite for the conducting of the apothecary business.

D. *The district Apothecary.*

§ 59. The examination for eligibility as district apothecary (Pharmaceutische Physikats Prüfung) takes place before a chemist, a botanist and an apothecary, who are members of the states examination commission.

§ 60. Approbated pharmacists, having conducted an officine in Northern Germany for two years, may apply for this examination, which consists

§ 61. A, in a treatise on some subject from the department of pharmaceutical administration; b, in an essay upon a theme of forensic analysis; c, in a forensic analysis with quantitative determination of the poison and an argumentative report; d, in the determination of one or more substances by means of the microscope; e, in a verbal examination on subjects from the same branches.

§ 62 refers to the keeping of minutes, the censuring on each branch in the same manner as in § 55, and to the final censure, which is to be "passed," or "not passed," the former only if the examination of neither branch was rated "bad" or "insufficient."

§ 63. The repetition of the examination on one of the branches is inadmissible. A re-examination can take place after the lapse of at least a year.

The passing of this last examination makes the pharmacist eligible into the various administrative bureaus. The district apothecary (Physikats Apotheker) is elected for five years, by the apothecaries of the larger counties (Kreise), or of several smaller counties; the government (Regierungs) apothecary is appointed for a province; the federal medical council (Bundes Medicinalbehörde), subordinate to the federal chancellory, consists of physicians and pharmacists, with a lawyer as chairman; strictly pharmaceutical affairs are decided by the pharmacists, and medical questions by the physicians only.

DEATH RESULTING FROM AN OVERDOSE OF STRYCHNIA.—AN INTERESTING CASE.

BY CHARLES BULLOCK.

A case of death, resulting from an overdose of strychnia, occurred recently in Pennsylvania under circumstances which render the case interesting and instructive to both medical practitioner and pharmacist.

The patient had been laboring under an attack of partial paralysis, and the medical attendant directed the following prescription :

R	Strychniæ Muriat:	gr. iss.
	Liq: Ferri Iodid:	ʒvj.
	Syr: Zingiberis q. s. ut ft:	fʒiij.

M.

Sig. dose a teaspoonful.

The whole of this prescription was used as directed, and the bottle returned to the druggist, by order of the physician, for renewal of the medicine, the dose on renewal being increased to one and one-half teaspoonful. This was taken with apparent benefit to the patient, until the last dose, exhausting the contents of the bottle, was given. About an hour after, while at a meal, the patient complained of strange sensations, and was soon affected with tonic spasms, which are described by two medical gentlemen, who were called in, as well marked results of an overdose of strychnia. Proper remedies were promptly used and the spasmodic action passed away, leaving the patient able to speak, but greatly prostrated, and failing to respond to stimulants death ensued in a few hours.

The bottle which contained the medicine was produced before the coroner's jury (composed of physicians and pharmacutists). It appeared to have been drained of its contents to make up the last dose; adhering to the bottle were well-formed crystals, some of them about a line in length and one-fourth line in thickness. Unfortunately no chemical examination was made to determine whether the crystals were *undissolved* muriate of strychnia or iodide of strychnia. A microscopical examination failed to carry much weight, on account of the destruction of the form of the crystal by washing previous to mounting, the size of the crystal not being accepted in evidence, as crystals of iodide of strychnia were

shown nearly as large, made by simple deposition from a warm saturated solution.

The pharmacist by whom the prescription was compounded testified, "that he weighed out the muriate of strychnia, threw it into a graduated measure, added the two other ingredients, and stirred them up with a bone spatula until he thought the strychnia had all dissolved, as he could see no undissolved crystals or solid matter." To a question, he replied that he noticed an opalescent appearance, resembling a quinine mixture.

An inmate of the house with deceased testified, "that she was sure that the bottle of medicine was never shaken."

The prescription as above given had been sent to several prominent pharmacutists, and the compoundings criticised by the jury. In some no chemical change was discernible, in others crystals readily recognizable as iodide of strychnia were floating through the mixture and deposited in the bottom of the bottle. In one case large crystals were contained in the bottle, evidently of the original strychnia salt undissolved.

The jury, after weighing all the evidence, returned a verdict of "Death from prostration, following the accidental administration of an over dose of strychnia.

"The jury farther find, from examination of the assistant pharmacist, by whom the prescription was compounded, a want of proper attention to, or information in manipulation, which they cannot pass without notice and reprimand, as both efficiency and safety may depend on careful manipulating skill when potent remedies are prescribed.

"They farther find that the ingredients of the prescription are subject to such chemical changes as renders the strychnia contained therein *liable* to be precipitated to the bottom of the bottle containing the prescription; and if the bottle should remain without proper agitation, an overdose of strychnia might result."

So much for the history of the case. We now wish to make some remarks on the chemical and pharmaceutical character of the prescription, and throw out some thoughts on prescribing and compounding, as suggested by this case.

Muriate of strychnia is not officinal in the U. S. nor British pharmacopœias, and is rarely prescribed. It is much less soluble

than the sulphate, requiring 50 parts of water, at 71° F., for solution (Gmelin's Handbook). The solubility of iodide of strychnia is not found in any authority which I have consulted. It is spoken of as *very insoluble*. My own determinations make its solubility 0.54 parts in 100 parts of water, at 60° F.*

When a drop of syrup of iodide of iron is added to a cold saturated solution of muriate of strychnia, the insoluble iodide of the alkaloid is immediately formed.

I have before me the prescription alluded to in this communication, put up in two ways. In both the muriate of strychnia was previously dissolved in 5iss of water. In No. 1 the strychnia solution was mixed with the iodide of iron, and the ginger syrup immediately added and well shaken. In No. 2 the strychnia solution was first added to the syrup of ginger, well shaken and the iodide of iron added. In No. 1 the bottom of the bottle is covered with crystals of iodide of strychnia, and many floating crystals suspended in the mixture. In No. 2 no decomposition is discernible, and after standing four days no deposit has taken place.

On page 1418 of the U. S. Dispensatory, 13th edition (1870), after quoting from this Journal the experiments of Bouchardat and Gobley on the insolubility of iodine combinations with strychnia, the authors add: "But though this fact *establishes the impropriety of combining solutions of iodine and strychnia in prescriptions*, yet it by no means justifies the inference drawn from it, that iodine might serve as an antidote to strychnia. Indeed, the contrary has been proved by the experiments of Mr. S. Darby, who found the precipitated iodide of strychnia was highly poisonous to the lower animals, &c."

We have, in the above quotation, information given regarding the insolubility of iodide of strychnia and the impropriety of prescribing iodine and strychnia solutions in combination.

It is clearly the duty of the pharmacist to see that when potent remedies are prescribed in solution that the *solution is complete*. He ought, also, if allowed to dispense such articles, to

* Hydrochloric and even acetic acid much increase the solubility of the iodide, without apparent decomposition, when the acids are very dilute.

be informed regarding decompositions liable to occur, and if possible guard against mischief likely to result therefrom, or else return the prescription to the writer, with his objections clearly stated. He should also notice, when such a prescription is returned for renewal, whether any deposit has taken place in the bottle, and remove it by washing should such be the case. The question whether it is his duty to mark the bottle "Shake well" when the recipe gives no such direction, is one admitting of different opinions; but we think, when so marked, the error, if any, is on the side of prudence.

We would suggest to physicians, when prescribing a remedy like strychnia in solution to its usual *full dose*, to prescribe it alone, and to give *separately* whatever else may be deemed advisable. We have in our experience been made aware of changes unforeseen and unknown to us, until the event developed the facts.

Philadelphia, June 15, 1870.

THE PERCENTAGE SYSTEM.

MR. EDITOR.

Dear Sir: If not intruding, will you allow your humble correspondent a few words in your valuable journal? The subject may not be, in a scientific point of view, of direct advantage to the profession at large, but it may be productive of some good, and serve to promote the dignity as well as the final interest of our vocation. It is a subject also in which the public is deeply concerned, for whose benefit alike we should labor. No where could the matter be better introduced than in the columns of the Journal of Pharmacy, where it will be at once brought before the public bar, and where it will especially meet the immediate verdict of the proper opinion. In our profession we stand before the tribunal of scientific criticism and of commercial intercourse; and every false theory, or every deviation from honest dealing, is subject to the public judgment. It burthens us therefore with sorrow when we are called upon to chronicle the shortcomings of professional brothers who would seek to further their own gains at the expense of their neighbors; or who would sink themselves to the level of genteel beggary.

The present article is not written with animosity towards any one; nor is it dictated by any other than a kindly spirit. The author does not know that he has ever suffered in consequence of unfair dealing from any quarter; duty alone suggested his action.

That our occupation has been for a long time, and still is, degraded by many engaged in it, is a well-established truth; and that many of the higher profession have assisted in this degradation cannot be denied. That a remedy is seriously required all may concede.

The degradation to which I allude, sir, is the practice of offering and allowing physicians a percentage on their prescriptions. This humility has been whispered around for years past with muttered condemnation, yet none so bold as to proclaim the dishonesty.

It is not the writer's intention to charge so grave a matter upon any single individual, or upon any particular class of druggists. It is sufficient to know that the evil does exist; and the guilty ones only will feel the just rebuke. Those physicians who would thus stoop from their high position, must certainly know the injustice they do their patients, when they consider from whose purses the percentage generally comes. They must know, also, how utterly cruel it is to send, often a poor creature, in inclement seasons to a distant store for trifling medicines which could be obtained equally as well from competent druggists in the immediate vicinity; and then, in many instances, only to be overcharged for their trouble. How unfair! How dishonorable! thus to impose on the necessary ignorance of others.

May I ask you, kind reader, is it not time the evil was cried down? Is it not time, in this era of religious, political, scientific and industrial reformation, that the druggist should arouse from his humility, assert his manhood, and prove to the world that he is not the miserable wretch as depicted by Shakspeare, who would sell his veriest poison for a paltry mite of gold, even to send a poor soul to its final account? Our calling is a noble one, needing but a little advancement to rank with the noblest of all. Will you not, Mr. Editor, lend us your influence to destroy this habit, which has become a public shame?

Respectfully, your obedient servant,

Baltimore, Md., May 31, 1870.

A. CALDWELL.

NURSING SYRUP AND WORM LOZENGES.

The following recipes have been sent to us by Mr. Henry C. Morse, pharmacist of Elmira, N. Y., with the assurance that they are the real formulæ of the preparations indicated, and that they are at the service of the readers of the Journal. Mr. M. remarks :—

“The nursing syrup is an excellent preparation, and is sold quite extensively with us, not as a patent medicine, but from the large bottle, as we do ‘Godfrey’s Cordial,’ being a much finer looking preparation, not unpleasant to the taste and quite as harmless.

“The ‘Worm Confections’ might be used in places where there is a demand for reliable goods in that shape, and when one does not like to recommend patent medicines of unknown composition.”

“*Mrs. Wheeler’s Nursing Syrup.*”

R	Sacchari,	℥xxxv.
	Liquoris Calcis,	℥xl.
	Extracti Papaveris fluidi,	℥jv.
	Olei Anisi,	℥i.
	Extracti Podophylli Aquati,	℥ss.
	Spiriti Rectificati,	℥ij.
	Misce.	

“*Mrs. Wheeler’s Worm Confections.*”

R	Hydrargyri Chloridi Mitis,	℥i.
	Sacchari,	℥x.
	In pulv. subtilis. tere.	

Adde.

	Sacchari,	℥xxv.
	Santonini,	℥vi.
	Misce et fiat. rhom. No. 360.	

Please observe that the syrup contains about two drops Extractum Papaveris fluidum in each teaspoonful; and the confections contain one grain Santonin and one-sixth of a grain of Calomel in each tablet.

The Ext. Podophylli Aquati is of the same strength as the ordinary fluid extracts, 16 Troy oz. to the pint.

REVIEWS.

Die Pflanzenstoffe in chemischer, physiologischer, pharmakologischer und toxikologischer Hinsicht. Für Aerzte, Apotheker, Chemiker und Pharmakologen bearbeitet von Dr. Aug. Husemann (Professor der Chemie an der Kantonschule in Chur) und Dr. Theod. Husemann (Privatdocent der Pharmakologie und Toxicologie an der Universität Göttingen). Berlin, Julius Springer, 1870.

The vegetable compounds in their chemical, physiological, pharmacological and toxicological relations. For physicians, apothecaries, chemists and pharmacologists.

We have received the first part of this work (256 pages), which the authors hope to complete in two more parts of about the same size. We consider it of such importance as to deserve an extended notice, although we can hardly do justice to the great labor bestowed upon the subject.

The introductory chapter treats, in a concise manner, on the nourishment of plants, the changes which the inorganic food undergoes in passing from cell to cell, on the importance of the proximate principles of plants in medicine, and their internal, endermatic and hypodermic employment, on physiological and pharmacological observations, and on toxicology. The chapter concludes with the classification of the vegetable compounds adopted by the authors, namely, in proximate principles (alkaloids, acids, neutral principles) and in mixtures (volatile oils, resins, fats).

The following 43 pages contain the general remarks on the alkaloids, a historical sketch, their occurrence in certain natural orders, genera, species, and different parts of plants, their preparation and purification, their physical and chemical properties, forensic analysis, physiological action and therapeutical uses, antidotes and the forms in which they are usually exhibited.

The different alkaloids are then considered, arranged according to the natural orders in which they occur, and the text amply supplied with marginal notes to facilitate the finding of the different subjects. For morphia (p. 111-145) we find the following subheadings: Literature (chemical, pharmacological and toxicological), discovery, occurrence, preparation, processes (Sertür-

ner, Hottot, Merck, Duflos, Wittstock, Mohr, Robertson-Gregory), preparation of all important principles in opium, morphimetry (Guillermont, Roussille, Guibourt, Schacht, Hager, Kieffer, Fleury), yield, properties, purity, composition, salts (simple and double), decomposition (sulphomorphid, oxymorphia, apomorphia, methylmorphia, ethylmorphia), behavior to reagents, forensic analysis, history of its pharmacological and toxicological relations, relation to the activity of opium, action on animals, result of physiological experiments with animals, elimination, action on man, symptoms of acute poisoning, toxical and lethal doses, post mortem appearance, antidotes, physiological proofs, therapeutical use, contra-indication, dose and application.

The other alkaloids are treated similarly, and, as is evident from the foregoing, pretty exhaustively. We have observed very few omissions, for instance, the occurrence of berberina in *Coptis trifolia* and *Menispermum canadense*, while, on the other hand, the literature has been made use of to the very time of publication, as in the case of buxina, which, in accordance with Flückiger's arguments, is regarded identical with Wiggers' pelosina and MacLagan's bebeerina. The pharmaceutical literature of the United States has been consulted pretty thoroughly, though it is apparent in one or two references, dating back some 12 or 15 years, that the original papers were not at the authors' command. The medical literature of the United States is hardly referred to, except what became known in Europe through the British journals. Among others, we miss the researches on narceina by Dr. J. M. Da Costa (1867).

The work supplies a want which has been frequently felt, and it certainly deserves a prominent place in the libraries of scientific men. The getting up of the work is creditable alike to the publishers and the authors, who have corrected it with great care.

J. M. M.

Materialien zu einer Monographie des Inulins, von Dr. G. Dragendorff, ord. Professor der Pharmacie an der Universität Dorpat. St. Petersburg, 1870.

Materials for a monograph on inulin, &c.

This work is a critical review of all the investigations and

statements concerning inulin which have appeared since its discovery by V. Rose, in 1804, in the periodical and other literature of continental Europe. To clear up many contradictory statements of other investigators, and to ascertain the relation of inulin to the development of those vegetables in which it is found (*compositæ*), the author has undertaken numerous experiments, the results of which are merely given, without tedious descriptions and repetitions. The immense number of facts enumerated and reviewed are described concisely and with terseness. The historical introduction is followed by chapters on the occurrence, the preparation, the composition, the properties and chemical behavior, the qualitative and quantitative determination of inulin, and its relation to other carbohydrates, as well as its importance for the plants. These headings of the various chapters do not convey any idea either of the exhaustive research into the literature, or of the tedious investigations on this subject, pursued by the author. The book gives a succinct account of our knowledge of inulin up to the present time, and for a good deal of the same we are indebted to the indefatigable investigations of the author. The work is printed in clear type, upon 141 pages, large octavo. It contains copious references to the original essays of the various writers on inulin, and has been very carefully corrected, the typographical errors being very few, and easily corrected.

J. M. M.

Die Analyse des Harns. In Fragen und Antworten für Mediziner und Pharmaceuten zusammengestellt, von Dr. Arthur Casselmann. Mit 3 lithographirten Tafeln. St. Petersburg, 1868.

The analysis of urine. In queries and answers for physicians and pharmacists. With three plates.

This little work, which was received only a few weeks ago, is an excellent pocket companion for those who are interested in the analysis of urine. The entire arrangement is very comprehensive, and the queries greatly facilitate the reference. The answers are concise and clear, and the operations and tests are described with sufficient minuteness. We believe that a translation into English would be welcome to many of our pharmacists, and particularly physicians, who would gladly accept such a very practical guide in urinary analyses.

J. M. M.

GLEANINGS FROM GERMAN JOURNALS.

BY JOHN M. MAISCH.

The Volatile Acids of Croton Oil, according to A. Geuther, are mainly acetic, butyric and valerianic acids, probably some œnanthylic acid, and of the oleic series perhaps pyroterebinic and higher acids. A liquid acid $C_8H_6O_4$ (Schlippe's crotonic acid) does not occur in croton oil, nor is its solid acid identical with angelic acid, with which, however, it agrees in composition, $C_{10}H_8O_4$. This tiglinic acid constitutes more than one-third of the volatile acids of croton oil; it fuses at $64^\circ C.$, and boils at $201.1^\circ C.$, while angelic acid fuses at 45° and boils at $190^\circ C.$ —*Zeitschr. f. Chemie*, 1870, I, 26–28.

Decomposition of Oxalic Acid in Aqueous Solutions. Giov. Bizio found (*Il nuovo cim.* [2] 1.272) that 0.4 grm. oxalic acid in one litre of water is gradually oxidized by the atmospheric oxygen to carbonic acid, while more concentrated solutions are permanent.—*Ibid.* II, 52.

Paper from Hop Stems is made at a factory near Marseilles, in France; it is of an agreeable whiteness, strong and soft.—*Pharm. Zeitg.*, 1879, N. 22.

Liebig's Infusion of Meat, being of a red color, is very soon disliked by the patients; by filtration it becomes of a pleasing appearance, and is taken for a much longer time without becoming repugnant; after maceration the magma is thrown upon a filter, a little more of meat and water having been used.—*Ibid.*

Adulteration of Saffron. Heræus noticed about 9 years ago an adulteration of (5 cwt.) saffron with 12 per cent. chalk and 4 per cent. honey, and calls attention to the fact that Spanish saffron is sometimes met with adulterated by honey, sometimes by honey and chalk. Honey causes the saffron, when pressed in the warm hand, to cake together and become sticky; chalk is readily observed on throwing the saffron into water, when the chalk subsides.—*Wittstein's V. Schr.*, 1870, 91, 92.

Myrobalans are recommended by R. Hennig for the preparation of tannin. They are about one-fourth to one-third the price of Chinese, and one-eighth to one-sixth the price of Aleppo galls. The former yield 45, the next 75 and the last 65 per

cent. of tannin. Sound and light colored myrobalans are reduced to a coarse powder, washed with cold water, dried and treated with ether in the usual manner. The tannin obtained is closely related to the tannin of Aleppo galls.—*Pharm. Centr. H.*, 1869, 370.

Pure Chloroform, made by E. Schering from chloral hydrate, and after having been treated with pure concentrated sulphuric acid, has a specific gravity of 1.5022 at 15° C., and boils between 62.3 and 62.5° C. Exposed to the sunlight for several days it is not altered in the least, and Hager concludes that those who observed differently, experimented with an impure chloroform. The best and only rational mode for preparing chloroform for internal use is, according to Scherer, from chloral hydrate.—*Ibid.*, 1870, 128–139.

Test for Chloral-Alcoholate. Hager uses Lieben's iodoform test for detecting the presence of alcohol in chloral hydrate, and operates as follows: About 0.5 grm. chloral hydrate are dissolved in 10 c.c. distilled water, the solution is made lukewarm, and sufficient solution of iodine in iodide of potassium is added to render it dark brown; potassa solution is now carefully dropped in until the liquid is just rendered colorless. Every drop of the potassa solution produces a turbidity which disappears on agitation if the chloral hydrate is pure, but is permanent in case of alcohol being present, from the formation of iodoform, a portion of which is dissolved by the chloral.—*Ibid.* 155.

Solubility of Sulphates in Sulphuric Acid. If sulphuric acid containing lime, baryta, strontia or lead, is evaporated in a platinum dish, the sulphates of these bases are obtained in the form of small shining crystals, which are not altered by raising the heat above 338° C., the boiling point of sulphuric acid. H. Struve found that 100 parts of acid will dissolve

	Concentrated Sulphuric Acid.	Nordhausen Acid.
Sulphate of lime,	2.03	10.17
“ baryta,	5.69	15.89
“ strontia,	5.68	9.77
“ lead,	0.13	4.19

—*Zeitschr. f. Anal. Chemie.*, 1870, 34–38.

Pure Methylic Alcohol does not yield iodoform with potassa and iodine; its formation points out impurities, like acetone, ethylic alcohol, &c.—A. Lieben, in *Annal. d. Chem. und Pharm.*, Suppl. vii, 377.

Ferricyanide of Potassium. Prof. E. Reichardt recommends, even on the large scale, the substitution of chlorine by bromine for oxidizing the ferro- to the ferricyanide of potassium. If bromine be added in small quantities the reaction will be completed after some agitation in a few minutes; the crystallizing salt will be much purer than if made by chlorine, and from the mother liquor the bromine may be recovered. *Archiv d. Ph.*, April, 1870, 48–50.

Extract of Meat. Prof. Reichardt has analyzed an extract of meat, which has made its appearance in German commerce and is prepared by Buschenthal & Co., in Montevideo. After comparing his results with Liebig's, Vogel's and his own analysis of the extract furnished by the Liebig Company of Fray Bentos, he comes to the conclusion that the absolute purity of Buschenthal's preparation cannot be doubted.—*Ibid.* 55–57.

Bellis perennis, Lin. J. B. Enz has analyzed the flowers of this plant with the following result: Loss on drying, 8.14; etherial extract, 1.8, containing tannin (green precipitate with iron salts), volatile oil, malic acid, potassa and lime salts, wax, fat, chlorophyll, fermentable sugar, acrid and bitter principle; alcoholic extract 3.2, containing sugar, tannin, tartaric and malic acids, potassa and lime salts, resin, anthoxanthin, acrid and bitter principle; aqueous extract 7.0, containing mucilage, anthoxanthin, potassa, lime and magnesia in combination with tartaric, malic, muriatic, sulphuric and phosphoric acids; 1.1 extracted by very dilute muriatic acid, consisting of pectin, gum, oxalate of lime and phosphates of lime and magnesia; 3 per cent. albuminous matter was extracted by dilute potassa solution; a minute quantity of volatile oil and 2.5 per cent. lignin. The author's process for obtaining a solution of the odorous principle appears to be applicable for other vegetable substances; it is as follows: the flowers are macerated for a week with glycerin, expressed, the liquid diluted with water, agitated with chloroform, the chloroformic solution evaporated spontaneously,

and the residue dissolved in pure alcohol.—*Wittstein's Viertelj. Schr.*, 1870, 1-14.

Extract. Physostigm. Venenos. Alcohol. J. B. Enz obtained, by exhausting Calabar beans with alcohol of 83 sp. gr., 2 per cent. of a deep green extract, the color of which is not altered by concentrated sulphuric acid, but on the subsequent addition of bichromate of potassa changes to blood red. The alkaloid is not entirely taken up by alcohol from the Calabar bean, unless the same be previously deprived of resin and fat by ether. The author recommends to preserve this extract (and other narcotic extracts) by Appert's method against the influence of light and air.—*Ibid.* 14-16.

Oxidation of Paraffin by Fusion. Bolley and Tuchschnid ascertained that paraffin, heated to 150° C. in contact with the air, is slowly converted into a dark brown body, which is elastic like caoutchouc, becomes gelatinous at 100° C., does not fuse at a higher temperature, is insoluble in alcohol, ether and acids, slightly soluble in benzol and boiling alkaline solutions, and contains 70·04 C., 10·25 H. and 19·71 O.—*Ibid.* 291, from *Schweiz. polytechn. Zeitschr.*, xiii, 65.

Poisoning by Arnica Flowers. Dr. A. Schumann, of Dresden, relates the case of a woman who, for suppressed menstruation, drank an infusion of a handful of arnica flowers. After half an hour she was taken with violent vomiting and severe congestion, in a few hours with intense pain in the stomach and intestines, when after nine or ten hours collapse set in. On the third day the pains returned, and together with intercurrent diarrhoea, continued for eight days longer, notwithstanding suitable treatment.—*Zeitschr. d. aesterr. Apoth. Ver.*, 1870, 134, from *Schmidt's Jahrbücher*.

Estimation of Iodine. W. Reinige uses a solution of 2·5 grm. permanganate of potassa in 497·5 grm. distilled water, one gramme of which oxidizes two milligram. iodine to iodic acid; the presence of iodate, chlorine and bromine are without influence on the result. The operation is performed as follows: the iodine is combined with potassium, the solution is rendered faintly alkaline, and heated to boiling, when the solution of the

permanganate is gradually added until the liquid above the rapidly subsiding precipitate of peroxide of manganium remains of a reddish color; the excess of the permanganate is now titrated with hyposulphite of soda.—*Zeitschr. f. Anal. Chem.*, 1870, 39–41.

Permanganate of Potassa in Alkaline Solution.—Dr. Mohr proves that if this solution is absolutely free from organic matter it may be heated to boiling without turning green. (*i. e.*, becoming reduced to manganate). For making such solutions fused alkalies only ought to be employed, and the use of filtering paper, strainers and all organic materials ought to be carefully avoided.—*Ibid.* 43–45.

P. W. Hofmann's Method of Preparing Pure Hydrochloric Acid (see Amer. Jour. Pharm., 1869, 420), according to Fresenius, yields in all stages of the process an acid containing much arsenic, if this metal was present in one of the crude acids, and also free chlorine, if the sulphuric acid contained oxides of nitrogen.—*Zeitschr. f. Anal. Chem.*, 1870, 64–66.

Influence of Ammonia on Guaiacum Paper. A Greiner found that guaiac paper, moistened with a very dilute solution of sulphate of copper and exposed to the vapors of ammonia or carbonate of ammonia, assumes a blue or blue green color, and regards it as hazardous to attempt to distinguish these gases from hydrocyanic acid merely from the different tints produced with this test paper (HCy colors it indigo blue).—*Ibid.* 94, 95.

Sanguinarina. H. Naschold has prepared this alkaloid and a number of its compounds and studied their properties; his formula for the alkaloid is $C_{34}H_{15}NO_8$.—*Zeitschr. f. Chem.*, 1870, 119–121, from *Journ. prakt. Chem.*

Among the prize queries of the Academy of Medicine in Madrid for the year 1871, is one to demonstrate, by practical experiments, which variety of poppy is best adapted to culture in Spain, the yield of opium and the percentage of morphia contained therein.—*Pharm. Zeitung*, 1870, No. 22.

The philosophical faculty of the University of Goettingen has published the following prize query of the Beneke fund for the year 1870: The exact determination of the atomic weight of

the metals of the earths, together with proofs on the limits of errors in the results obtained; also a critical analysis of the scientific material bearing on this point; the faculty desires also a treatise on the query, whether the hypotheses of Prout and Dumas ought to be rejected, or whether the differences between these hypotheses and the observations may be explained by sufficient chemical or physical reasons. The essays must be written in the German, Latin, French or English language, and handed in by August 31, 1872. First prize 500 thalers, gold; second prize 200 thalers, gold.—*Ibid.* N. 31.

The Petroleum Industrial Society of Halle has offered two prizes of 5000 thalers (\$3,500) each, 1, for the discovery of a chemical compound to purify crude paraffin presscakes with little loss (not over 5 per cent.), and, 2, for the discovery of apparatus, &c., for cooling quantities of paraffin at every season to at least 5° C. (21° F.)—*Ibid.* N. 33.

ON THE DISTRIBUTION OF NITROGENATED COMPOUNDS IN HYOSCYAMUS NIGER AND ALBUS, IN DIFFERENT STAGES OF THEIR DEVELOPMENT.

BY ERNST THOREY.

Pharmaceutische Zeitschrift für Russland, 1870, p. 129–142, publishes extracts from the inaugural essay of the author, from which we extract and condense some tables, showing the variation of the percentage of the nitrogenated compounds in different periods of the growth of the plants. We give the results only for the *dry* parts, and for the minute analytical details refer to the original. The numerous analyses, while on the one hand pointing to an intimate relation between some of the nitrogenated compounds, prove also the effect of climate and soil, and show the necessity of having the leaves of henbane collected during the early stages of its growth, or until the flowers have made their appearance.

Of the analytical processes employed, it must be mentioned that the alkaloid was determined by Mayer's test solution, the nitric acid by Schulze's modified method with aluminium, and the ammonia as platinochloride of ammonium from the distillate.

obtained by treating the material with caustic soda, distilling with strong alcohol and collecting in muriatic acid. The albumen was estimated from the amount of nitrogen obtained by deducting the nitrogen contained in the alkaloid, nitric acid, ammonia and nitrogenated resin (present mainly in the seeds) from the entire amount of nitrogen contained in the plant and estimated by elementary analysis.

Hyoscyamia is best prepared from the bruised seeds, which must be previously exhausted by petroleum ether to free it from fixed oil. The seeds are now exhausted by alcohol acidulated with a little muriatic acid, the alcohol is distilled off, so that the residue weighs about one-fifth of the original weight of the seeds, half the quantity of water is added, the alcohol entirely evaporated, the resin filtered off and the filtrate evaporated in vacuo to one-half. It is now agitated with chloroform to remove coloring matter, then supersaturated with potassa and again repeatedly agitated with chloroform. The chloroformic solution of the alkaloid is agitated with water slightly acidulated with muriatic acid, which, on evaporation, yields yellowish white muriate of hyoscyamia crystallizing in needles united in the shape of a cross. One kilogramme yields about half a grm. If the aqueous solution is treated with potassa and agitated with chloroform (or benzine) the pure alkaloid will, on evaporation, be left behind in fine needles; ether and amylic alcohol will yield it in an uncrystallized state.

The analyses of *Hyosc. niger* for 1868 refer to plants or parts of plants collected from seven different localities, the third columns of each series to plants from the botanical garden at Dorpat. *Hyosc. niger* analysed in 1869, and *H. albus* analysed in 1868 and 69 were raised in the same botanical garden.

Hyoscyamus albus, 1868. *Percentage for the dry material.*

	Before flowering (beginning of June.)		Flowering plants (middle of August.)		Fruit bearing plants (middle of Sept.)	
	Alkaloid.	Saltpetre.	Alkaloid.	Saltpetre.	Alkaloid.	Saltpetre.
Leaves.	0.588	1.325	0.359	1.378	0.211	1.104
Stems.	0.012	0.078	0.036	0.072	0.027	0.041
Roots.	0.128	0.054	0.146	0.039	0.106	0.039
Fruits and Seeds,					0.162	

Hyoscyamus niger, 1868. 1. *Percentage of Alkaloid.*

	Before flowering (end of May.)				Flowering plants (end of June.)				Fruit bearing plants (end of August, September.)				
Leaves,	0.208	0.188	0.154	0.216	0.224	0.158	0.147	0.173	0.042	0.055	0.065	0.069	0.012
Stems,	0.075	0.084	0.070	0.080	0.046	0.030	0.082	0.034	0.003	0.004	0.009	0.008	
Roots,	0.057	0.032	0.027	0.052	0.204	0.193	0.127	0.134	0.052	0.049	0.028	0.057	
Fruits with Seed,									0.066	0.086	0.075	0.101	
Seeds,												0.163	0.106

2. *Percentage of Nitrate of Potassa.*

Leaves,	2.082	1.328	1.221	1.361	1.692	1.120	1.015	1.200	0.275	0.056	0.639	0.864	0.194
Stems,	0.383	0.198	0.162	0.171	0.101	0.182	0.149	0.154	0.011	0.009	0.044	0.069	
Roots,	0.248	0.106	0.107	0.211	0.119	0.170	0.192	0.206	0.050	0.042	0.024	0.073	
Fruits with Seeds,									0.083	0.103	0.128	0.102	
Seeds,												0.076	0.040

The following table exhibits the quantitative results of the dry material grown in 1869; the column of May 6th refers to the cotyledons of the sprouting plant; that of May 28th to young plants, three weeks old.

Hyoscyamus Albus.						Hyoscyamus Niger.			
	May 6.	May 28.	June 15.	July 20.	Sept. 11.	May 9.	June 2.	July 6.	Sept. 2.
Leaves, } Stems, } Roots, } Seeds, }	Alkaloid.	0.4506	0.4102	0.4694	0.3292	0.4989	0.1927	0.2061	0.1107
					0.0480		0.0174	0.0302	0.0105
				0.1764	0.2625	0.0808	0.0199	0.1379	0.0559
					0.1727				0.1187
Leaves, } Stems, } Roots, } Seeds, }	Nitrate Potassa.	0.3871	0.7234	1.2726	1.0599	1.3850	1.4268	0.9914	0.8206
					0.0711		0.0910	0.1844	0.0571
				0.1235	0.0500	0.1084	0.1155	0.2425	0.0351
					0.0688				0.0371
Leaves, } Stems, } Roots, } Seeds, }	Ammonia.	0.0771	0.1813	0.2568	0.5702	0.3171	0.7305	0.7435	0.7669
					0.1386		0.1605	0.1814	0.1038
				0.1127	0.3869	0.1546	0.1540	0.4240	0.1471
					0.1017				0.2613
Leaves, } Stems, } Roots, } Seeds, }	Albuminates.	28.86	28.05	19.40	16.59	28.11	17.63	16.71	10.31
					10.97		6.50	9.97	8.99
				24.33	26.66	25.99	19.13	19.38	13.82
					10.43				10.46

The decrease and increase of the nitrogenated constituents appears to occur in the plant with a certain uniformity. The

albuminates decrease in all the organs towards autumn ; but if the dry substance of the entire plant is taken in consideration, their absolute quantity is increased.

J. M. M.

ILLUMINATING GAS FROM PETROLEUM.

BY, C. A. MARTIUS.

The very low price of petroleum has caused many experiments to be made to utilize it for the production of illuminating gas. This has been best accomplished by Hirzel, of Leipzig, who uses crude petroleum, or preferably the residues left on the rectification of the crude oil, which may be obtained at a low price.*

The gas is produced by conducting the oil from a reservoir through a tube in a uniform current into a red hot retort ; the gases pass through an ascending tube, a receiver and a condenser filled with bricks into the gasometer. The process is very simple and devoid of danger. About 200 cubic feet of gas are obtained in an hour. An obstruction in the tubes does not occur, but after some time the retort must be opened and the coke raked out.

This is undoubtedly the purest illuminating gas, and consists only of carbohydrogens, which are not condensed by cold or pressure, and may be kept without alteration and without losing its illuminating power. Neither oil nor tar is separated in the pipes, and the gas is free from carbonic acid, sulphurous and ammoniacal compounds, so that it may be collected in the gasometer without undergoing any purification.

It is remarkable for its high specific gravity, = 0.698 (coal gas = 0.42) and its great illuminating power, which is four and a half to five times greater than that of ordinary coal gas, so that burners may be used which consume only three-fourths to at most one and a half cubic feet per hour.

It has a peculiar odor, so that leaks in the pipes may be readily discovered ; but the odor, which reminds of acetylen, is different from and less disagreeable than that of coal gas. Acetylen is present in this gas in such proportion that the acetylen-

* Hirzel's gas apparatus is figured and described in the American Engineer of June 18, 1870, published by Evans & Co., Philada.

copper compounds may be readily obtained from it in large quantities.—*Wittstein's Viertelj. Schr.*, 1870, 284—286, from *Ber. der deutschen Chem. Gesellsch.*, 1868, Nos. 7 and 8.

J. M. M.

PURIFICATION OF DEXTRIN.

BY DR. H. HAGER.

R. Forster has analyzed some commercial dextrin with the following results :

Dextrin,	72.45	70.43	63.60	59.71	49.78	5.34
Sugar,	8.77	1.92	7.67	5.76	1.42	0.24
Insoluble matter,	13.14	19.97	14.50	20.64	30.80	86.47
Water,	5.64	7.68	14.23	13.89	18.00	7.95

The insoluble matter consists mainly of unaltered starch.

Dextrin is a very good vehicle for dry narcotic extracts ; it has also been recommended by Becker for internal use as an excellent stomachic ; for medicinal use, therefore, dextrin must be purified, which, according to Hager, is best accomplished in the following manner :

10 parts dextrin are dissolved in a cylindrical vessel in 18 parts cold distilled water by agitation ; after standing, the clear solution is decanted or strained through flannel and mixed with $1\frac{1}{2}$ to 2 volumes of 95 per cent. alcohol. The liquid is decanted from the doughy precipitate which is dissolved in little distilled water, and the solution spread upon glass or porcelain plates to dry in a warm place.

Purified in this way and rubbed to powder, dextrin is a whitish or white powder, which dissolves in distilled water to a clear, yellowish, nearly inodorous solution, of a mild and sweetish mucilaginous taste ; diluted with water it must acquire merely a faint violet tinge with iodine water, owing to the presence of a small quantity of soluble starch, which is of no importance. To free the dextrin entirely from this starch, the clear, aqueous solution is mixed with enough alcohol to produce a strong turbidity, decanted after standing for a week and then completely precipitated ; or the impure solution of 10 dextrin in 18 water is mixed with 3 parts of alcohol, decanted after a week and then precipitated by $1\frac{1}{2}$ volumes of alcohol.—*Wittstein's V. Schr.*, 1870, 113—115.

J. M. M.

PROCESS FOR PRODUCING A BRIGHT COATING OF PLATINUM UPON GLASS, PORCELAIN, &c.

BY PROF. DR. R. BETTGER.

The first requisite is perfectly dry platinum chloride, entirely free from acid, which, in a small porcelain mortar, is well triturated with oil of rosemary, to be renewed several (about three) times, until the brownish red chloride forms a black soft plaster-like mass, free from undecomposed chloride. The oil of rosemary by combining with chlorine, turns yellow; it is removed and the residue is then triturated with about five times its weight of oil of lavender, until the whole forms a thin, uniformly homogeneous liquid, which is set aside for about half an hour, when it is ready for use.

This thin liquid is painted, by means of a soft brush, in a uniform, very thin, layer upon the porcelain, china or glass; for the thinner the layer the more lustrous will afterwards be the platinum coating. All that remains now to be done is to heat the objects for a few minutes to a very dull, scarcely visible, redness, when, if this temperature has not been exceeded, they appear with a most beautiful silvery lustre, without requiring any additional labor.

Should, through some neglect, the platinum coating be imperfect, or should an object have been broken, the platinum may be recovered without the use of aqua regia, by the following extremely simple galvanic process: The coated surface is covered with ordinary muriatic acid, and then touched with a zinc rod; in consequence of the evolution of hydrogen from both sides of the platinum, this is at once separated as an extremely thin film, which, notwithstanding its specific gravity, partly rises to the surface. On filtering off the muriatic acid, the whole of the platinum is recovered.

It is important not to keep the platinizing liquid on hand over a day, since it deteriorates on keeping.

The active portion of the liquid is an organic platinum salt, which may be obtained in faintly yellow, small octohedrons, on carefully pouring alcohol on a larger quantity of the liquid; the crystals, on the approach of a flame, burn with a bright light,

leaving platinum behind of a bright whiteness and in a compact condition.

The author particularly recommends this process for the preparation of mirrors for microscopes, as well as for astronomical purposes.—*Wittst. Vierteljahres Sch.*, 1870, 39—41, *from Jahresb. d. physik. Ver. zu Frankfurt*, 1867—68.

J. M. M.

ON THE RHATANY ROOT OF PARA.

BY DR. F. A. FLÜCKIGER.

In a thesis “*Etude comparée sur le Genre Krameria et les racines qu’il fournit à la médecine*,” presented by Cotton, in 1868, to the Paris Ecole de Pharmacie, he describes, under the name of rathanhia des Antilles, a root, the origin of which he referred to *Krameria Ixina*, which yields the *Savanilla rhatany*. Dr. Flückiger has examined Cotton’s root, and found it identical with the rhatany described by Berg, in 1865, under the name of Brazil rhatany. In larger quantities the officinal *Payta rhatany* has a red, the *Savanilla* a violet and this *Para rhatany* (so-called because exported from Para) a grey-brown color. The latter, like the *Savanilla rhatany*, is colored blue-black by sulphate of iron; it possesses, in comparison to the other two roots, a remarkable elasticity; the transverse fissures frequently have sharp turns and occasionally surround the root, and some roots have occasionally numerous globular suberous warts two to three millimetres in diameter. These external marks, particularly if not merely a few pieces are examined, are entirely sufficient for recognizing the *Para rhatany*.

The author sums up his remarks as follows:

1. There are at present in commerce three different kinds of rhatany, which are best named after their principal ports of exportation, *Payta*, *Savanilla* and *Para*.
2. The first two kinds are described according to origin and characters in every modern work on pharmacognosy.
3. The *Para* root was first described by Berg, as *radix ratanhæ* brasiliensis*, by Cotton as rhatany of the Antilles.

* Dr. F. argues that *rathanhia* is more proper than *ratanha*. According to the distinguished botanist, Richard Spruce, *rattani*, in the language of the Quichuas, means I pack, tie &c., and *rathanhia* is probably derived from the same root. The Spanish Pharmacopœia of 1865 writes *ratania*.

4. Its color varies between dark grey and brown; the extremes of this color were regarded by Cotton as black and brown varieties.

5. This color is very distinct from that of *Payta* and *Savanilla rhatany*.

6. The origin of *Para rhatany* is unknown.

7. The substitution, in medicine, of *Payta rhatany* by another is inadmissible. There exist in regard to the tannin, chemical differences which deserve to be investigated. The tannins predominating, or exclusively present perhaps in *Savanilla* and *Para rhatany*, produce bluish black precipitates with iron salts. —*Schweiz. Wochenschr. f. Pharm.*, 1869, 227-231.

J. M. M.

ON A SPECIES OF IPOMŒA, AFFORDING TAMPICO JALAP.*

BY DANIEL HANBURY, ESQ., F.R.S., F.L.S.

Two centuries and a half have elapsed since Jalap, the tubercule of a convolvulaceous plant of Mexico, was introduced into the *Materia Medica* of Europe. The botanical origin of the drug long remained unsettled, evidence of which exists in the fact that two plants, neither of which yields jalap, have in succession received, and still retain, the specific name *Jalapa*. The veritable source of jalap, however, was brought to light between the years 1827 and 1830,† in which latter the plant was described by Wenderoth as *Convolvulus Purga*. In 1833 it was figured by Hayne under the name of *Ipomœa Purga*; but in 1839 it was transferred, on account of its tubular corolla and exserted stamens, to Choisy's genus *Exogonium*. As this genus has been recently united to *Ipomœa* by Dr. Meisner, it appears best to return to the name proposed by Hayne, and to call the true jalap-plant *Ipomœa Purga*.

The unsettled condition of Mexico, and the fluctuations of commerce, have alternately depreciated or enhanced the value of jalap, and have led to the occasional importation of other roots possessing more or less of the characters of the true drug. Of

* From the author.

† Mr. Hanbury, as a just historian, might well have noticed the labors of Dr. Coxe and Mr. Nuttall in this connection. See D. B. Smith's paper *Jour. Philad. Col. Pharm.*, vol. 2, April, 1830.—ED. AM. JOUR. PHARM.

such kinds of jalap, one of the most remarkable is a tubercule imported a few years ago for the first time from Tampico, and thence called *Tampico Jalap*.* This drug has been extensively brought into the market (that is to say, by hundreds of bales); and though it is less rich in resin and less purgative than true jalap, yet, on account of its lower price, it has found a ready sale, chiefly in continental trade.

As the botanical origin of this so-called Tampico Jalap, and even its place of growth, were completely unknown, I addressed a letter, in November 1867, to my friend Hugo Finck, Esq., Prussian Vice-Consul at Cordova (Mexico), begging that he would, if possible, procure for me some information on the subject. Mr. Finck at first expressed strong doubts as to Tampico jalap being anything else than the root of *Batatas Jalapa*, Chois., known in Mexico as *Purga macho*. Upon inquiry, however, he ascertained that such could not be the case, but that it is a production of the State of Guanajuato, where it grows along the Sierra Gorda, in the neighborhood of San Luis de la Paz. At this town and in the adjacent villages, it is purchased of the Indians and carried by the muleteers to Tampico, where it is known as *Purga de Sierra Gorda*.

All attempts to procure specimens of the plant were for some time fruitless, chiefly owing to the difficulty of finding any one in the district who could be induced to take the needful trouble. The perseverance of Mr. Finck and his friend Mr. E. Benecke, Consul General for Prussia in the city of Mexico, overcame at length this obstacle, but only to meet with others hardly less embarrassing. The first lot of specimens dispatched from Guanajuato was stolen from the mail; the second shared the same fate; while a third, which included live tubercules, was, by successive detentions on the way, fully five months in reaching England. The box, however, came to hand in June last (1869); and amid a mass of damp earth and decaying matter, I had the satisfaction of discovering one solitary tubercule exhibiting signs of vitality. This, placed in a greenhouse and carefully nursed, soon began to grow with rapidity, and, on removal to an open border, produced a tall and vigorous plant, which towards Sep-

* I cannot, at least, trace this jalap to have been offered in commerce as a distinct sort earlier than about five or six years ago.

tember showed signs of flowering. It was then taken up and replaced in the greenhouse, where it blossomed freely in October last, but did not mature any seeds. Accompanying the tubercules, but of course in a separate box, my correspondent sent some pressed and dried specimens from Guanajuato, which correspond perfectly with the growing plant.

Having ascertained, from the study of these materials, that the plant belonged to the genus *Ipomœa*, I endeavored to identify it with some species described in the "Prodromus" of De Candolle, or in the subsequently published "Annales" of Walpers, but without success. Neither was I able to find any corresponding specimen in the herbaria of the British Museum or of the Royal Gardens of Kew. In the Paris Museum there is a plant, collected by Galeotti on the lofty Cordillera near Oaxaca, which, so far as scanty specimens enables me to judge, accords precisely with that received from Mr. Finck. It bears a number which is not mentioned in the enumeration, by Martens, of Galeotti's *Convolvulaceæ* (contained in the "Bulletin de l'Académie Royale de Bruxelles" *); and I therefore conclude that it is unnamed. Under these circumstances, I have drawn up the following diagnosis and description of the plant, which I propose to call *Ipomœa simulans*. The specific name is chosen in allusion to the remarkable similarity which the plant bears in foliage and habit to the true jalap (*Ipomœa Purga*, Hayne), not to mention the resemblance of its tubercules. The funnel-shaped corolla and pendent flower-buds of the Tampico jalap-plant are quite unlike the corresponding parts of *I. Purga*, and furnish a ready means of distinguishing the two species:—

IPOMŒA SIMULANS, sp. nov. Radice tuberosâ, caule volubili herbaceo glabro, foliis ovatis, acuminatis, cordatis v. sagittatis, indivisis, pedunculis unifloris solitariis, sepalis parvis.

Hab. in Andibus Mexicanis *Sierra Gorda* dictis, prov. Guanajuato (fide cl. *Finck*); in regione frigidâ ad ped. 8000 propè Oaxaca (*H. Galeotti*, no. 1369!).

Radix napiformis v. subglobosa v. elongata, carnosa, 2-3 poll. longa, basi fibrillosa. *Caules* herbacei, graciles. *Folia* glaberrima, 2-4 pollicaria, 1-2 poll. lata, lobis baseos acutis v. rotundatis v. subtruncatis, petiolo tenui, 1¼-2¼ pollicari. *Pedunculi* axillares, petiolum subæquantes, penduli, uniflori v. in plantâ vegetiore novelli alabrastra

* Tome xii. pt. 2 (1845), p. 257.

duo ferentes, altero semper (ut videtur) abortivo. *Pedicelli* incrassati, basi bracteis 2 minutis. *Sepala* ovata, obtusa, exteriora paululum breviora. *Corolla* infundibuliformis, $1\frac{1}{2}$ –2 poll. longa, glabra, rosea, pallidè striata. *Stigma* bilobum. *Capsula* calycem superans, conica, 2-locularis, valvis 4 coriaceis. *Semina* glabra.

—*Extracted from the Linnean Society's Journal.*—*Botany*, vol. xi.

METHYL-ETHYLIC ETHER.—A NEW COMPOUND FOR THE PRODUCTION OF RAPID GENERAL ANÆSTHESIA FOR SHORT OPERATIONS.*

BY BENJAMIN WARD RICHARDSON, M.A., M.D., F.R.S.

In introducing the subject before the Medical Society of London on the 14th instant, the author explained that within the past two or three years a practice had been followed of producing quick insensibility, which should be followed by equally quick recovery. Two agents had been employed for this purpose (*b*) nitrous oxide gas and bichloride of methylene. Accepting that the principle of producing quick insensibility had a practical intention and usefulness, Dr. Richardson said he had objection to the methods which, up to the present time, were adopted for carrying the principle into practice. His objections to nitrous oxide gas were as firm as ever. He held still, that the employment of an agent which excluded all atmospheric air during inhalation, which produced the most perfect asphyxia, which required for its administration costly and troublesome apparatus, and which, if administered beyond a given period, even for a few seconds, must of a necessity kill, was a bad agent for anæsthetic administration, was, in fact, a rude and vulgar process, retrogressive in science.

Respecting bichloride of methylene, though it was hard to speak against any application of a remedy which he, the author, had introduced, he must be candid and say that he was not favorably impressed with the application of bichloride for *quick* general anæsthesia. That it was marvellously rapid in its action was true, that it answered the end it had in view, was true, and that it had now been used for rapid inhalation an immense number of times was also true. But these facts could not conceal

* Abstract of Papers read at the Medical Society of London on March 14 and 21.

the further and all-important fact, that the bichloride of methylene belonged to a dangerous family of chemical substances, and could not, therefore, be played with without risk. It had been extolled as being safer than chloroform, and that was allowed; for as it contained an equivalent of chlorine less than chloroform, it was materially safer, but the safety was relative not absolute. Under these impressions, the author was led recently to review experimentally the action of the whole of the more promising anæsthetic fluids and vapors, including chloride of methyl, bichloride of methylene, chloroform amylene, hydride of methyl-ethylic ether, methylic ether, and some others, which were given on a table placed before the society. The result was that he had decided in favor of methylic ether for rapid anæsthesia. The anæsthetic properties of methylic ether were first discovered by Dr. Richardson, in 1867, and the substance has been reported upon by him in two reports to the British Association for the Advancement of Science. On the 20th of May, 1868, he inhaled it for the first time himself, Dr. Sedgwick and Mr. Peter Marshall administering it to him to complete insensibility. He was narcotized completely in one minute, was unconscious in seventy seconds, and recovered almost instantaneously without nausea, headache or other unpleasant symptom. From that time the author has been in the habit of narcotising occasionally with methylic ether, and recently with marked success.

The ether is made by digesting one part of pure methylic alcohol with two of strong sulphuric acid. The mixture is heated, and the methylic ether, which passes over as a gas, is subjected to frequent washings in strong potassa solution. The ether remains as a gas even below zero; it has an ethereal odor; it is chemically an oxide of the radical methyl; its vapor density is 23, taking hydrogen as unity. The strongest objection to methylic ether is that it is a gas, but, happily, the difficulty is to a large extent overcome, the gas being very soluble in various substances; water takes up thirty-seven volumes of the gas, yielding an ethereal fluid of very pleasant taste; pure ethylic ether and alcohol take up over 100 volumes, and chloroform and bichloride of methylene nearly as much. For practical purposes the author prefers absolute ethylic ether of sp. gr. .720,

and boiling point of 920° F. as the solvent. The ether is charged with the gas at a temperature of 32° F., and the compound is at once bottled and firmly corked down. It should be kept for a time before being used, the process of keeping producing a comparatively stable compound. In using this compound, which he proposes to call methyl-ethylc ether, the author at present employs the simple mouthpiece invented by Mr. Rendle, and made merely of leather. He is adding to this a reserve bag, in order to conserve the ether. From one to two drachms may be put into the inhaler for quick narcotization.

Dr. Richardson next described cases in which the methyl-ethylc ether had been administered to the human subject for the extraction of teeth; in eleven cases the whole operation, from commencement of the inhalation to the complete recovery, was under three minutes; in several cases one minute was sufficient, while in two cases forty-five seconds sufficed. In no case was there spasm, syncope, or asphyxia during inhalation, or any after nausea, and in all cases there was a semi-consciousness, so that the patients did what they were bade to do, remembered what had been done, and yet were not conscious of pain.

The author next described the action of methyl-ethylc ether on the nervous centres, comparing it with chloroform and other anæsthetics containing chlorine. He showed that this ether produced no excitation of the nervous centres which supply the vascular system as chloroform does; and that, consequently, there was absence of muscular spasm, of contraction of blood-vessels and of syncope from fatal contraction of the heart. When it was carried to the extent of arresting life in the inferior animals it produced death, by paralyzing the organic nervous centres. This extreme result was preceded by convulsive action, similar to that which is seen in death from hæmorrhage, the convulsion being due to the absence of arterialized blood in the muscles. So well, however, did the heart still retain its power, that in one case, in a lower warm-blooded animal—a guinea pig—the respiration returned *spontaneously* in pure air four minutes and forty-five seconds after it had ceased. No fact could more definitely speak in favor of the safety of this agent.

In conclusion, the author said that as he had confined himself this time to rapid anæsthesia for short operations, his remarks

must be taken as bearing on that subject only. He had introduced methyl-ethylic ether as the readiest and best agent he knew of for the purpose described. It was better than nitrous oxide gas, because it allowed air to be given with it, and did not asphyxiate; it was better than bichloride of methylene, because it did not produce muscular spasm and syncope. At the same time he did not consider it as perfect, nor should he consider general anæsthesia perfected, until he or some other observer shall discover an agent that will destroy sensibility without interfering at all with organic muscular life, volitional power, or consciousness. Methylic ether approached this perfection, though it did not touch it, and it encouraged perseverance in experimental research. For these reasons it was worthy the attention of the society.

Dr. Richardson again brought this subject before the Medical Society of London on the 21st instant. He dwelt upon the value of methylic ether as a general anæsthetic, recording his experiences of it during the last eight days. He mentioned the difficulties he had encountered, first in keeping the methylic ether in solution, and secondly in method of administration, and explained how these difficulties were to be met. Respecting method of administration, he said that the ether must be confined in a bag, in connection with the inhaler, and from the bag it must be volatilized, by means of a hand bellows. The instrument for this purpose was shown, the elastic bag contained layers of domette to receive the ether. By this means all the ether was utilized, and usually two drachms would be found a sufficient quantity. Dr. Richardson reported, that since the last meeting of the society he had administered the ether seventeen times, and with a success quite equal to his expectations. The ether produced quick relaxation of the muscles, with dilatation of the pupils, and this last was a good test of insensibility. The blood which flowed during an operation retained its arterial hue, and there was no sign of asphyxia, or of vomiting. Recovery was rapid, and methylic ether promised to be the best and safest of anæsthetics. In prolonged operations it might be advantageously mixed with bichloride of methylene, the two fluids being in equal parts. The effect of bichloride in causing spasm and vomiting was greatly controlled by the ether.—*The Med. Press and Circular, Dublin, March 30, 1870.*

ON FLUID EXTRACTS.

By E. H. SARGENT.

The great importance which attaches to this class of preparations, and the near approach of the revision of the Pharmacopœia, must constitute my excuse for presenting the following suggestions:

Simplicity is a cardinal virtue, either in or out of a pharmacopœia, but more especially in the construction of formulas for the use of American apothecaries.

That pharmacists should prepare all, or nearly all the Galenical preparations which they are called upon to dispense, will admit of no doubt; it therefore is a duty to simplify our processes in such a manner that they will, while meeting the requirements of medicine, induce all pharmacists to manufacture these preparations for themselves, yet it is undeniably a fact that only a small minority do so, and the reason may be sought for with some profit, if it, when found, induces a change for the better. It is hardly necessary to call attention to the great variety of fluid extracts offered for sale, nor to the well known dissimilarity in the productions of different manufacturers, showing utter neglect of the pharmacopœia in nearly all cases, and in some a sad lack of the proper medicinal strength, thereby materially impairing the moral force of the pharmacopœia, and, what is of greater importance, furnishing inferior medicine to the sick. The injustice of dispensing inferior preparations falls chiefly upon the physicians and their patients; as the physician can determine the dose proper to be administered, only from his knowledge of the drug itself, it is of the utmost importance that the preparation shall fairly represent a known quantity of the drug. The quantity is immaterial, so that it is known, as the fitness of any preparation for a certain use must be left for the physician to decide, from his knowledge of it; and the knowledge must be definite or he may fail, and place in danger the life of his patient. The physician lacking this knowledge has no method of determining the character of a preparation (until he has seen its effect) except by its physical properties, and all must be aware how little can be known from the taste, smell, or

appearance of a fluid extract, showing the importance of employing a standard that shall not be violated by the caprice, or the more unworthy motive of avarice, of the vendor. It certainly is no light matter to trifle with life and health; the laws of conscience, if not the laws of the land, should prevent it, and every incentive should be presented that is possible, to encourage both the pharmacist and the manufacturer to prepare and sell only officinal preparations, whenever formulas are supplied.

In considering the present officinal formulas for fluid extracts it may be asked, what is the design or purpose of a formula? The reply will be, that pharmacists may prepare the article as ordered. Then it must follow that all formulas *should* be constructed so as to adapt them to general use. Such certainly was the intention of the revisers of our own national pharmacopœia, but after a trial of ten years are the results satisfactory with the class referred to? It will not be denied that, with a *few* exceptions in our larger cities, apothecaries depend upon the manufacturing specialist for the supply of fluid extracts. In looking for a reason may we not safely assert that nearly all the objections met with originate in the practically impracticable formulas of the pharmacopœia, requiring, as they do, a degree of skill, a perfection of manipulation, and an honesty of purpose, which, at least, are none too common. This charge made against pharmacists may lead some to suspect that ordinary honesty is a rare quality in the trade, but the inference is not a fair one. The objections to the present formulas are many and serious. The extracts offered by manufacturers are recommended by leading medical journals and appear satisfactory to physicians, who, it may be stated, have learned their strength by experience, and, therefore, know what quantity to prescribe, so that wilful dishonesty is not charged, but the fact remains, as the writer has verified by many inquiries, that not over ten per cent. of the apothecaries in the U. S. prepare or sell fluid extracts made in accordance with the formulas of the U. S. Pharmacopœia. It may be said that the greater fault is with the apothecary, but how shall it be remedied? is the serious question. No ordinary arguments or appeals for the authority of the pharmacopœia will suffice. The difficulty must be met by removing all excuse for

it, and the furnishing of practical formulas for fluid extracts, suited to the requirements of the limited trade of the majority of American pharmacists. The best method for removing the difficulty should be honestly sought and applied. To the writer, no other yet presented promises so much as the suggestion of Mr. Diehl, so ably advocated in the *Pharmacist* for April, by Mr. Bartlett, showing the advantage of a reduction in the strength of fluid extracts. It points out an easy and unobjectionable method for correcting the greatest abuse that pharmacy and medicine now suffer from. It is necessary to keep in mind, when considering proposed reforms, that we must take the world as we find it, *time* being necessary for reconstruction. It is also the part of wisdom to make only such laws as we are able to enforce. Is it wise, therefore, to retain a series of formulas that not one out of ten apothecaries will attempt to use? Rather, is it not our duty to so modify the formulas that each well-disposed pharmacist will prepare what he requires for dispensing? There need be no compromise with ignorance, nor with dishonesty in this matter, for the better reasons are all in favor of the proposed change, while it is difficult to name a sufficient reason for maintaining the present standard. Perhaps the best one adduced is that it is convenient for physicians to remember the proportion of "ounce to ounce," yet it is difficult to imagine a memory so poor as to forget the proportion of one half ounce of the drug to the fluid ounce of extract, particularly when we now have two preparations of that strength.

The only other reason urged, of any weight, is that such a standard was adopted ten years ago, and has been generally advocated as the right one, yet, to admit this as a good argument, would prevent making any changes in our present formulas. Further, this supposed reason is negatived by the fact, that the fluid extracts in common use are not made by this standard, nor equal it in strength.

Experience should lead to improvement, and prejudice should be cast aside in questions of so much importance as this.

The present system forces a compromise with right by compelling a large majority of druggists to use the inferior preparations so extensively advertised by specialists, each claiming to

be better than his neighbors, and also claiming some marvellous method of his own for cheapening medicines. The evil complained of is not confined to fluid extracts, as it is becoming a too common habit to prepare tinctures and syrups from these inferior commercial preparations. It is by such use that the lack of proper quality becomes most apparent. The writer has been shown tinctures and syrups thus prepared which bore no resemblance to the officinal, yet were dispensed in full assurance that the effect would be satisfactory.

The concentration of vegetable tinctures beyond a certain limit, by the use of heat (even *in vacuo* ?), tends directly to the injury of the same, as well as to unnecessary expense and difficulty in the process. No one who has prepared officinal fluid extracts can doubt that this *limit* has been passed, yet no advocate for the present strength has proposed to dispense with partial evaporation, nor can it be otherwise.

The larger dose which will be required if the strength is reduced, may be named as an objection, but it has, in most instances, no value. The dose, as at present made, will vary with the drug used, from one drop to a teaspoonful, but in all cases the dose, whatever it may be, is given diluted, and the quantity of *drug* being the same, the diluted dose will be no larger in one case than in the other. It may be urged that a larger quantity of alcohol will be given, but only in a few instances will the objection hold good, and in none to a mischievous extent. The use of glycerine and sugar, in many preparations, taking the place of a portion of the alcohol, forming far more palatable vehicles, and when it is kept in mind, as it should be, that the majority of fluid extracts sold scarcely exceed this reduced strength, these fancied objections vanish, as the dose, in most instances, will not be increased noticeably, if at all, as any prescription file will demonstrate.

No apothecary who dispenses officinal fluid extracts can have failed, occasionally, to find himself in difficulty from the dangerous doses prescribed of *veratrum*, *conium*, *hyoscyamus* or *bella-donna* (the prescription being based upon the use of commercial preparations).

It may be said that the physician is at fault, but that does not

relieve the difficulty in the least ; such has been, and such will be the case so long as this difference exists. It may be further urged that all this class of fluid extracts (the narcotic) are far more concentrated than is desirable, either for the physician or the pharmacist.

There is an old saying, that “if the mountain will not come to Mahomet, Mahomet must go to the mountain.” In this case it may apply, and even at the risk of apparent concession, it may still be both prudent and right to concede, where it is evident folly and injury to insist.

The pharmacist will rarely, and the specialist will never, make their fluid extracts according to the present officinal formulas, nor by others involving similar objections, for evident reasons. Why not change the standard to one that each will faithfully observe, for similar reasons, *i. e.*, self-profit. All of the more powerful could be more safely used, be more uniform and more reliable, if made of the reduced strength, which, at least, would counterbalance any apparent objection in those less powerful ; further, *all* the fluid extracts could be of uniform strength, including *cinchona* and *wild cherry*.

By following the proposed method of Mr. Bartlett, each pharmacist, no matter how limited his trade, could properly prepare his own fluid extracts, without needless loss of material, or unnecessary expense, a *desideratum* that no other method proposed will accomplish, yet of the greatest importance, both to the individual, and in its influence upon the progress of pharmacy.

Let us, by all means, have formulas for this very important class of preparations, which shall commend their use to the retail apothecary, and, in view of the near approach of the revision of the pharmacopœia, no time is so opportune as the present for agitating the question of what the standard strength and process shall be.

The following table illustrates the proper dose of nearly all of the fluid extracts (officinal strength) which are largely prescribed, except the *cinchona* and *wild cherry*, of which the strength will not be changed by the proposed reduction :

	16 oz. to pint.	8 oz. to pint.
Aconite	1 to 3 drops.	2 to 6 drops.
Belladonna	1 " 3 "	2 " 6 "
Blackberry	$\frac{1}{2}$ fl. drachm.	1 fl. drachm.
Black Cohosh	$\frac{1}{2}$ " "	1 " "
Buchu	$\frac{1}{2}$ " "	1 " "
Colchicum	5 to 10 drops.	10 to 20 drops.
Conium	5 " 10 "	10 " 20 "
Dandelion	1 fl. drachm.	2 fl. drachms.
Ergot	$\frac{1}{2}$ " "	1 " "
Gelsemium	5 to 10 drops.	10 to 20 drops.
Gentian	$\frac{1}{2}$ fl. drachm.	1 fl. drachm.
Henbane	10 to 15 drops.	20 to 30 drops.
Ipecac.	3 " 20 "	6 " 40 "
Jalap	$\frac{1}{2}$ fl. drachm.	1 fl. drachm.
Leptandra	$\frac{1}{2}$ " "	1 " "
Mandrake	$\frac{1}{2}$ " "	1 " "
Nux Vomica	3 to 10 drops.	6 to 20 drops.
Pink root	1 fl. drachm.	2 fl. drachms.
Rhubarb	10 to 30 drops.	20 to 60 drops.
Sarsaparilla.	$\frac{1}{2}$ to 1 drachm.	1 to 2 drachms.
Seneka	$\frac{1}{2}$ fl. drachm.	1 fl. drachm.
Senna	1 " "	2 " "
Stillingia	$\frac{1}{2}$ " "	1 " "
Valerian	$\frac{1}{2}$ to 1 drachm.	1 to 2 "
Veratrum Viride	2 to 4 drops.	4 " 8 drops.

It will be seen that in only five of the above examples, when reduced, a dose exceeding a teaspoonful will be required in ordinary cases, and in each of the five the alcoholic strength need not exceed that of dilute alcohol. In ten of those remaining the dose will range from 3 drops to 30; of those yet remaining the dose will average one fluid drachm.

Chicago, April, 1870.

—Pharmacist, May, 1870.

"CINCHO-QUININE."

Read before the California Pharmaceutical Society, March 14th, 1870.

BY W. T. WENZELL, Chemist.

This is an article put into the market purporting to be manufactured by Jas. R. Nichols & Co., of Boston, under the above name; they claiming their preparation to fully represent all of

the alkaloids naturally contained in calisaya bark. A printed circular is also extensively circulated among physicians, entitled “The Chemistry of the Cinchona Barks,” taken from the *Boston Journal of Chemistry*, the organ of the above mentioned firm, through whose pages their preparations are fully heralded. The circular commences with an array of glittering generalities on “Some of the Chemical Constituents of Calisaya Bark, and the Methods usually Employed in their Separation.” We further notice a statement, which is unsupported by proof and medical authority, that all of the cinchona alkaloids possess equal febrifuge and tonic properties; and that quinia only acquired the rank of superiority as a febrifuge by reason of priority of discovery; a statement which is also incorrect, inasmuch as cinchona was discovered as early as 1810, by Gomez, whereas quinia was discovered ten years later, by Pelletier and Caventou. The “Cincho-Quinine” of Jas. R. Nichols & Co. is composed, according to their circular, of bark alkaloids, as follows: 1, Quinia; 2, Cinchonia; 3, Quinidia; 4, Cinchonidia; 5, other alkaloidal principles present in the bark.

The claims advanced as to its superiority over the sulphate of quinia are, namely: that “Cincho-Quinine” contains the whole of the active febrifuge and tonic principles of calisaya bark; that it exerts the full effects of sulphate of quinia in the same dose, without causing cerebral disturbances; that it is nearly tasteless, and less costly than sulphate of quinia. The dose of the preparation is left to the discretion of the physician with the direction that it may be administered in doses varying from five to thirty grains.

The apparent insolubility of the “Cincho-Quinine,” its slight bitter taste and large medicinal dose, (30 grs.), have led me to investigate the true nature of the article presented. “Cincho-Quinine” is put up in imitation of sulphate of quinia, in ounce bottles. It appears in the form of white friable scales, which are almost tasteless, only a slight bitterness being perceptible. When placed upon reddened litmus paper, and a drop of alcohol added, the blue color of the litmus was promptly restored. It proved combustible without residue. When dissolved in water with the intervention of sulphuric acid, the solution tasted

analogous to one of sulphate of cinchonia, and the solution when strongly acidulated with the acid, possessed, in very slight degree only, the optical phenomena of fluorescence and epipolism. Dr. Bill's test of ferro-cyanide of potassium gave the known reaction for cinchonia. "Cincho-Quinine" was nearly insoluble in ether. Twenty grains of the preparation were dissolved in water with a sufficient quantity of sulphuric acid, and the solution subjected to Liebig's ether test, which dissolves quinia, quinia and cinchonina, also portions of quinidia and cinchonidia, if a large excess of ether be employed. The ethereal solution thus obtained by successive washings with ether, left on evaporation and drying a solid residue weighing about half a grain, possessing alkaloidal properties. This residue when dissolved in dilute sulphuric acid and water, and treated with Brande's chlorine and ammonia test, will indicate by its green coloration the presence of quinia, quinidia and quinia. The test responded in this instance affirmatively. In order to determine which of the alkaloids produced the coloration, one portion of the solution was tested for quinidia by Van Heijningen's test of oxalate of ammonia, and another portion was tested for quinia by Dr. Vry's test of iodide of potassium, but both gave negative results. Therefore the alkaloid detected by Brande's test is quinia, which was confirmed by the application of Hera-path's optical and chemical tests of the iodo-sulphates of the cinchona alkaloids. One grain of the mixed alkaloids obtained by Liebig's test from "Cincho-Quinine" by thorough exhaustion with ether, was dissolved in a fluid drachm of water sufficiently acidulated with sulphuric acid. The solution was then mixed with an equal bulk of alcohol, the mixture warmed to about 100° Fabr. and treated successively with tincture of iodine. The several (7) precipitates which appeared on cooling were amorphous resinous substances soluble in alcohol, and did not exhibit in the least degree crystalline structures. The precipitates first obtained were reddish in appearance, analogous to the salt of iodo-sulphate of quinia; the last precipitates possessed the purplish tint belonging to the iodo-sulphate of cinchonina. The absence of all crystalline characteristics of iodo-sulphate salts thus obtained from the alkaloids extracted by ether from "Cin-

cho-Quinine" point conclusively to the absence of quinia, quinidia and cinchonidia in the sample under examination, and we can safely assert that "Cincho-Quinine" is in reality only cinchonia containing about two per cent. of quinicia and cinchonicia.

In reviewing the above experiments and results in connection with Jas. R. Nichols & Co.'s circular, we unhesitatingly arrive at the following conclusions :

"Cincho-Quinine," although having the advantage of being nearly tasteless, does not contain quinia, quinidia and cinchonidia, and therefore does not represent the whole of the active principles of the bark.

It cannot exert the full effects of sulphate of quinia in the same dose, inasmuch as the stated dose of "Cincho-Quinine" is from five to thirty grains.

Although "Cincho-Quinine" appears to cost less than sulphate of quinia, it does not follow that commercial "Cinchonia," sold at four times its value, is a desirable substitute for quinine in an economical point of view.

And, lastly, one very important principle should by no means be lost sight of, namely : that a physician should always know what he is prescribing, and therefore the substitution of a remedy of less efficiency and uncertain medicinal value, is altogether unwarrantable and often hazardous.—*Pacific Med. and Surg. Journ.*, April, 1870.

ON THE EMPLOYMENT OF MEDICINAL HYDROCYANIC ACID.

BY M. DONOVAN, M.R.I.A.

In prescribing hydrocyanic acid medical practitioners occasionally indicate what they believe to be a specific strength by directing "Scheele's acid" to be used in compounding their prescriptions. The practical effect is to cause some degree of doubt in the mind of the compounder, bound, as he is, to the provisions of the Pharmacopœia, on the one hand, and the instruction given by the prescriber, on the other.

In some establishments two denominations are to be found—one prepared according to B. P., the other according to the prevailing opinion that Scheele's acid should be of three-fold

strength. This is certainly an unsatisfactory and unsafe state of things.

In the first place, I think I am warranted in affirming that the illustrious Swedish chemist never promulgated any formula for the preparation of a medicinal hydrocyanic acid. I have carefully searched his essays, and his letters to Crell, as well as his treatise on "Air and Fire," and could find nothing but an account of prussic acid, with which he conducted certain chemical researches with a view of ascertaining its nature and effects on other substances, but not having the least reference to its employment as a medicine; nor were any medical effects at that time attributed to it. The acid he used was prepared from commercial Prussian blue, a substance of *variable composition, as he himself ascertained*. A mixture of commercial Prussian blue, red precipitate, and water was boiled; the filtered solution was presented to the action of iron filings and dilute sulphuric acid, the clear liquid thus produced, being decanted, was distilled, and one-fourth drawn off; a few grains of chalk were added, and the liquor was re-distilled into a receiver containing "*a little water*." The whole of what Scheele wrote on the subject is contained in his 21st essay.

Here we do not discover any care to produce hydrocyanic acid of such normal strength as would insure identity of power in the same dose, at all times, with different samples of the medicine. I conclude, therefore, that the name "Scheele's acid" is a misnomer, leading to misconception, and even to danger.

No doubt a formula for hydrocyanic acid was introduced into the Pharmacopœia of the United States (1820) under the name of Scheele's acid, prepared from the same materials as those used by Scheele, but in different proportions, by a different method, and with a different result. This I believe to be the origin of the name "Scheele's prussic acid." But, as observed by Jourdan, "*la densité variable de l'acide hydrocyanique préparé suivant la méthode de Scheele ne permet pas de l'appliquer aux usages de la médecine*."

The acid prepared according to the British Pharmacopœia, as that authority informs us, contains, by weight of the solution,

2 per cent. of hydrocyanic acid ; 100 grains of it precipitated with a solution of nitrate of silver yield 10 grains of dry cyanide of silver. The unauthorised hydrocyanic acid prepared in London as "Scheele's strength" contains 5 per cent. of real acid ; 100 grains of it by weight should produce 25 grains of dry cyanide of silver when precipitated by solution of nitrate of silver. Thus, if five minims were intended as a dose for the former, the patient would practically have taken twelve minims if Scheele's strength were made use of. What the effect of such a dose might be, if repeated at intervals during the day, it is not for me to inquire. Of hydrocyanic acid, B. P., at the temperature of 60°, one drachm measure is equal to about 71 drops of the same acid dropped from an ordinary ounce bottle ; hence, 12 minims would be equal to $14\frac{1}{2}$ drops.

Some make light of a dose of three or four drops because they have known larger doses to prove harmless ; but were they quite sure of the condition of the acid employed ? It is to be kept in mind that concentrated hydrocyanic acid rapidly deteriorates, that even the dilute acid of the Pharmacopœia becomes weaker by age, and that the so-called Scheele's acid, being stronger than the latter, is still more liable to change ; hence, from its very weakness, arises another source of danger. On this subject Professor W. Gregory has thus expressed himself : "The average dose (of the medical acid) safe for an adult is one or two drops. It is much used as a sedative and anodyne ; but, unless its strength and dose be perfectly known, it is a dangerous remedy. Fatal accidents have occurred from prescriptions found, after experience, to act favorably, being made up in another place, or by the same druggist with a fresh stock, this fresh stock being exactly of the standard strength, while the previous acid had lost so much by keeping that the dose had been of necessity increased. There, danger actually arose from a too weak acid having been used." ("Organic Chemistry," 4th edition, p. 75.)

In all cases it will occasionally be necessary to test the condition of the hydrocyanic acid employed by the volumetric method directed in the B. P. And it would still further conduce to the safe employment of this dangerous medicine if, in-

stead of directing "Scheele's acid," prescribers would, in every case, subjoin B. P. to their prescriptions; this would put an end to all uncertainty.—*The Med. Press and Circular*, March, 1870.

ON ARTIFICIAL FLAKE MANNA.

BY EDWARD HISTED.

After the reading of Mr. Hanbury's "Historical Notes on Manna," at the meeting of the Pharmaceutical Society of November 3d, 1869, a few remarks were made by some gentlemen present respecting the existence of an artificial manna, said to be a very good imitation of the genuine. Some weeks since I was fortunate enough to become possessed of a specimen of this substance which had been brought from Paris, and was much surprised at the clever manner in which it had been produced, and the great resemblance it bore to what it was intended to imitate.

The consumption of manna in this country being comparatively small, a factitious or adulterated form of the drug would scarcely be accepted by pharmacutists; this may account for the artificial flake manna in question being so little known in England.

In the first volume of the *Pharmaceutical Journal* (1842) will be found a description of a spurious sort of manna having a singular resemblance to the genuine, but differing essentially in that it contained no mannite, but was mainly composed of sugar of fecula, or glucose.

The artificial flake manna, which I have made the subject of my experiments, is certainly something better than this; yet, though one may hesitate to stigmatize it as spurious, there can be no question it is intended to deceive, it being, according to the printed circular which is sold with it, manna of inferior quality which has been purified and made to assume the form of the large stalactitic pieces which constitute the most esteemed form of the drug. The printed circular accompanying each parcel, in fact, alleges that it consists entirely of natural manna, and that it is free from sugar, starch, jalap, scammony, or other foreign substance; that it differs only from natural manna in not being contaminated with slight impurities, such as particles of wood,

bark, and leaves, which are always found in the latter; and, finally, that it has precisely the same medicinal action as natural flake manna.

A cursory glance at this fictitious flake manna would lead to the conclusion of its being the finest natural flake manna, from which, indeed, the public would not readily distinguish it, but closer inspection reveals certain obvious differences. When broken, no crystals of mannite are to be seen in the interstices; there is an absence of the peculiar bitter taste and of the odor characteristic of good manna; the fictitious manna is cleaner, lighter, more uniform in color, and more solid, than is usual with natural flake; it dissolves more readily in water, and makes a clearer solution, which, when shaken, does not form a permanent froth. If one part be added to four of rectified spirit of wine, and the mixture be boiled for a few minutes, a residue, resembling clarified honey, will be obtained, whereas natural manna treated in the same way leaves a hard substance in irregular masses.

The fictitious flake manna afforded me about 40 per cent. of mannite; natural manna in fine stalactites, treated in precisely the same method, yielded about 70 per cent.

The crystals obtained by alcohol were identical, whether the artificial or natural drug were employed.

27, *Haymarket*.

—*Pharm. Journ., Lond., April, 1870.*

SIMPLE APPARATUS FOR RAPID EVAPORIZATION AT LIMITED HEAT, UNDER REDUCED PRESSURE, WITHOUT THE USE OF A PUMP.

BY A. B. PRESCOTT,

Assistant Professor of Chemistry, etc., University of Michigan, U. S.

The pump is not always at hand; its use is forbidden for transmission of corrosive vapors; and, moreover, the removal of liquids, in form of vapor, against the weight of the air by muscular power is liable to "exhaust" the operator more effectively than it does the material. I desire to ask attention to some uses of ordinary distilling apparatus, for the production and maintenance of approximate vacuum over liquids during their vapor-

zation, in cases where the heat of 120° to 150° F. may be applied.

It is necessary that the distilling apparatus be made capable of air-tight closure, and that the air be removed from it to begin with. Then the degree of exhaustion in the apparatus is in direct ratio to the rapidity of condensation of the vapor produced. And the rapidity of condensation is only limited by the degree and extent of refrigeration employed, with a given extent of evaporating surface at a stated temperature. The air in the apparatus, to begin with, may be expelled through a suitable aperture by steam, which may be generated in the "receiver" of the apparatus or in an attachment thereto.

Take two round-bottomed glass flasks, the one having a capacity four to eight times greater than the other. Adjust the smaller upon a water-bath, the larger at 10 to 15 inches distance from the other, over a sink or large basin, and connect the two with glass tubing and perforated caoutchouc stoppers, so that the connecting tube shall incline slightly downward from its bend close to the stopper of the small flask. The stopper of the small flask is also to have a second perforation, in which is fitted a straight glass tube, 2 or 3 inches long, its lower end placed even with the lower end of the stopper. The upper end of this tube is very slightly drawn out for a $\frac{1}{4}$ of an inch, and snugly fitted with $1\frac{1}{2}$ inch of firm rubber tubing, the upper $\frac{1}{2}$ inch of which is closed with a piece of glass rod of same diameter as the body of the tube.

Now put an ounce or two of water in the large flask, and the material to be evaporated in the small flask; close the stoppers perfectly, by turning the flasks under them, and leave open the straight tube. Apply, by the water-bath, the limited degree of heat until it is imparted to the contents of the small flask; then move a lamp under the large flask until the water in it has boiled briskly and the steam therefrom has escaped continuously from the straight tube for some minutes. Now close the straight tube with its caoutchouc cap, at the same time removing the lamp from the large flask. When the latter has cooled somewhat, wrap it smoothly with linen netting or gauze, and lead upon it a minute stream of cold water, controlling the same as required. The

liquid in the small flask boils briskly (if aqueous, boiling at 120° or 150° F.), and the refrigeration is governed to prevent too violent ebullition, lest liquid be thrown into the connecting tube; the degree of applied heat is governed to the same end.

An ordinary glass retort may be substituted for the small flask as an evaporating vessel, and its tubule may be fitted with a perforated stopper, admitting a thermometer. If there is not room in the stopper (of retort or flask) for both the thermometer and the steam-escape tube, the latter may be dispensed with by adjusting the stopper loose for escape of steam, and pressing it tight when the air is expelled. Flat-bottomed flasks favor equable boiling, but they are liable to collapse.

As a *condenser*, I have used, instead of the large flask, a copper vessel, for more ready application of heat without danger of breaking, and for more efficient refrigeration. This copper receiver is made of conical shape, with rounded bottom, a vertical diameter twice its horizontal diameter, and a neck bent to the angle of about 56° with the vertical axis of the vessel. The diameter of the neck is $\frac{3}{4}$ of an inch, to receive a retort beak, the joint being covered with a section of caoutchouc tubing. Or it may be fitted with a perforated stopper, to receive the connecting tube of the flask when evaporation is conducted in the latter.

With linen netting to spread the water over the free surface of the condensers, the evaporation therefrom refrigerates with a comparatively small supply of water. Using a copper condenser of the above described shape, a vertical diameter of 12 inches, and capacity of six pints, attached to an 8-ounce glass retort containing distillation promoters, I have vaporized 4 fluidounces of water in sixteen minutes at the constant temperature of 128° F. By ordinary care in the expulsion of air and closure of the apparatus, exhaustion can be invariably secured, fixing the water-boiling point at below 130° F.; that is, atmospheric pressure equal to at least 25 inches of mercury may be removed and sustained by availing ourselves of the displacing effect of steam, and the contraction of condensing vapor, in very simple apparatus.

Notwithstanding the illustrations of vacuum by condensation,

which abound upon the physical lecture table, I do not know whether the devices suggested in this note have been tried or proposed for small chemical operations by any one else.* I have recommended them to students, and we have found them satisfactory for various analytical, experimental, and pharmaceutical operations. We have employed them chiefly in such evaporations as are performed for the residue only, or, at least, not for quantitative recovery of the distillate, in various evaporations of quantitative analysis, in the elimination of non-volatile alkaloids, in determining the organic matter in water, and in preparing fluid extracts. To evaporate at ordinary temperatures by hand-pump exhaustion is especially irksome in those cases when application of 125° to 150° F. is objectionable. And to connect a vessel under which heat may be applied with the air-pump involves quite as much labor as the arrangement of apparatus for exhaustion by condensation.—*American Supplement to Chem. News, New York, Jan., 1870.*

ON THE ACTION OF SUNLIGHT ON SULPHUROUS ACID.

By O. LOEW,

Assistant in the College of the City of New York.

(Read before the "Lyceum of Natural Science," New York.)

We know that plants under the influence of the sunlight reduce carbonic acid and water to organic compounds, and organized parts; we know further, that the albuminous principles, as well as some ethereal vegetable oils, contain sulphur which doubtless comes from the sulphates contained in the soil. As regards this reduction of sulphuric acid, it seemed to me of interest to ascertain whether sunlight possesses any reducing power upon the oxygen compounds of sulphur out of the tissues of the plant. For this purpose I exposed diluted sulphuric acid, solutions of sulphates and sulphites and aqueous sulphurous acid under various conditions, in sealed tubes to the sunlight during the last summer.

* This method of producing a partial vacuum was employed by Barry (See U. S. Dispensatory—Evaporation of Extracts) more than forty years ago in making extracts and volatile oils.—EDITOR AMER. JOUR. PHARM.

It was only with the sulphurous acid that any change was noticed. The tubes containing this substance *remained clear during two months*, but after that time a disturbance set in which slowly increased, and sulphur was deposited in a finely divided state.

The sulphurous acid was thus gradually reduced to sulphur, but the oxygen was not liberated, another part of the acid having been oxydized by it to sulphuric acid. It seems very singular that a space of two months elapsed before any change was observed; it appears that the absorption of a great amount of light was necessary for the separation of the first atom of sulphur, which was followed then by more atoms in much shorter intervals of time.—*Amer. Jour. Science and Arts.*

New York, December, 1869.

ON THE TECHNICAL ANALYSIS OF SOAP.*

BY M. GASTON TISSANDIER.

The name of soap is given to true salts, formed by combining fatty acids (oleic, margaric,) with alkalies, such as soda or potash. The quality of a soap is ascertained by determining the proportion of fatty acid and alkali which it contains, and also the foreign substances—such as chlorides, alkaline sulphates, moisture, &c.—which always occur in varying proportions.

Fatty Acids.—Dissolve 5 grms. of the soap in question in $\frac{1}{2}$ a litre of distilled water, heated in a porcelain capsule; when dissolved, add a slight excess of dilute sulphuric acid, and let it boil for some minutes, so that the fatty acids may become separated and float upon the liquid. To weigh the fatty acids, cool them, and they will form a cake of grease, which must then be fused, in order to dry them, in a small tared porcelain capsule; this capsule, when again weighed, will give the amount of fatty acids corresponding to 5 grms. of soap.

Wax may also be used to facilitate the weighing. After the first part of the operation has been performed, and the fatty acids are floating, add 7 grms. of white wax, which will melt

* *Moniteur Scientifique.*

and mingle with them; cool the whole, take out the cake of wax, and weigh it, previously drying it between double filtering papers. The excess of weight gives the proportion of fatty acids.

Ash—Soda.—Calcine, at red heat, 5 grms. of soap in a platinum capsule. Weigh the ash thus obtained, and dissolve it in 200 c.c. of distilled water; determine the proportion of soda in 100 c.c. by means of normal sulphuric acid (alkalimetric standard), evaporate to dryness, and notice the action of bichloride of platinum upon the residue dissolved in water, to ascertain whether it consists of potash or soda. The estimation of the soda may be verified by directly taking the alkalimetric standard of the soap (5 grs.).

Chloride of Sodium.—Estimate the chlorine in 50 c.c. of the solution with the standard silver solution.

Sulphate of Soda.—The sulphuric acid is estimated in the remaining 50 c.c. of the solution with chloride of barium.

Non-Saponified Fatty Bodies.—These also occur in soap, and may be detected as follows: Dry 5 grms. of soap at 110° , after which treat it with common ether. Agitate it with that liquid in a flask, filter it, wash with ether, and evaporate the solution at 100° ; the residue will be the non-saponified fatty bodies. The ether may, perhaps, dissolve a little of the soap; it must, therefore, be ascertained that the residue is really fat—melt it, and try whether it will soil glazed paper.

Non-Saponified Carbonate of Soda.—Cut 5 grms. of soap into small fragments, and treat them with boiling alcohol, which does not dissolve carbonate of soda. Filter, and treat the insoluble residue with alcoholic acetic acid, which dissolves the carbonate of soda without acting on the sulphate of soda and chloride of sodium. The acetic solution, evaporated to dryness and calcined, leaves, as a residue, carbonate of soda. Weigh it, and, if verification be required, take its alkalimetric standard.

Glycerin.—Dissolve 5 grms. of soap in boiling water, decompose it with dilute sulphuric acid, and separate the isolated fatty acids by decantation. The liquid, which is completely neutralised by the carbonate of soda, is now evaporated to dryness

over a water-bath at 100° C.; the residue, composed of sulphate of soda and glycerin, is taken up by alcohol, which dissolves only the latter; it is then filtered and evaporated to dryness, when the residue will be glycerin. This is again taken up by alcohol, re-evaporated, and the residue again weighed, after ascertaining that it possesses all the properties of glycerin.

Water.—Cut the soap into thin slices; weigh 5 grms., and dry them on a stove at 120° C.

COMPOSITION OF VARIOUS KINDS OF SOAP.

Substances estimated.	I.	II.	III.	IV.
Water,	46.12	24.76	17.55	14.09
Soda,	4.98	7.30	8.48	9.01
Fatty acids,	37.99	64.50	71.45	74.68
Chloride of sodium,	6.30	3.12	2.12	2.00
Sulphate of soda,	0.72	0.32	0.40	0.22
Fatty bodies,	1.00	—	—	—
Glycerin,	2.89	—	—	—
Total,	100.00	100.00	100.00	100.00

[*Chemical News, London, Feb. 4, 1870.*]

ON CHRYSOPHANIC ACID.

BY DR. ROCHLEDER.

After referring at some length to the labors of many chemists, as well as those made by himself on this subject some years ago, the author enters into a discussion on the statements made by MM. Graebe and Liebermann respecting the composition of chrysophanic acid, and then says, that he has taken the trouble to prepare this acid in pure state from rheine, as prepared by Dr. Marquardt, at Bonn; this substance consists mainly of chrysophanic acid, emodine, and impurities; the composition of pure emodine dried at 100° is, in 100 parts, C, 65.75; H, 4.29; O, 30.18; formula: $C_{40}H_{30}O_{13}$; the formula which Messrs. Graebe and Liebermann give for chrysophanic acid, viz., $C_{14}H_8O_4$, cannot, according to the author of this paper, be the correct one, and this the less so, as no less than six different chemists have found for the formulæ of this substance, prepared from different sources and at various periods, the formula, $C_{56}H_{42}O_{17}=4$

($C_{14}H_{10}O_4$) + H_2O , because the H_2O of crystallization is only driven off at 115° ; it should be kept in view that emodine is very difficult to separate from chrysophanic acid, and M. Rochleder suspects that the statements of Messrs. Graebe and Liebermann about the action of pulverized zinc upon chrysophanic acid are vitiated by the presence of emodine in the acid used for these experiments.—*Chemical News, London, Jan. 7, 1870.*

METALLIC HYDROGEN.

At a recent meeting of the Lyceum of Natural History, in New York, a paper was read by Dr. Loew, assistant in the College of New York, "On the Preparation of Hydrogen Amalgam."

The researches of Graham went to show that hydrogen could be alloyed with palladium, and that it was also contained in meteoric iron. He condensed the hydrogen in the palladium, and came nearer proving its metallic character than any other person had done. Schoenbein in his search for ozone, found a method for making the peroxide of hydrogen, which brought him to the very threshold of discovering hydrogenium. Schoenbein's experiment was this—An amalgam of zinc and mercury is violently agitated in water; the water is then filtered, and, on being examined with iodide of starch and protosulphate of iron, will be found to contain peroxide of hydrogen or oxygenated water. Dr. Loew has carried the investigation further, and has, instead of oxidising the hydrogen, succeeded in combining it with the mercury. He takes an amalgam composed of not more than 3 or 4 per cent. of zinc, and shakes it with a solution of bichloride of platinum; the liquid becomes black, and a dark powder settles to the bottom. The contents of the flask are then thrown into water, and hydrochloric acid added to dissolve the excess of zinc. The amalgam of hydrogen and mercury at once forms in a brilliant voluminous mass, resembling in every way the well-known ammonium amalgam. It is soft and spongy, and rapidly decomposes, but without any smell of ammonia. The hydrogen escapes, and soon nothing but pure mercury is left in the dish. The experiment appears to show conclusively that an amalgam of

hydrogen and mercury can be formed, and that hydrogen is really a metal. It would also throw some doubt upon the existence of the amalgam of ammonium and mercury, and offer an explanation of that compound on the basis of its being the same amalgam of hydrogen and mercury that is prepared in the way now pointed out by Dr. Loew. The smell of escaping ammonia must be traced to some other source than the existence of that radical in combination with mercury.—*Chem. News, Lond., May 13th, 1870, from Scientific American.*

NICKEL LINNÆITE.

To the Editor of the Journal of the Franklin Institute :

Sir,—The valuable metal, nickel, now employed extensively in preparing various alloys resembling silver, for table use, and in making the coins of the United States and other countries, has been but seldom found in this country. In small but not paying quantities, there are several localities of it; and the only one which promises to yield it in abundance is the deposit of Mine la Motte, Missouri, so celebrated already for its copper, lead, iron, and other ores. A specimen of nickel linnæite or siegenite has been received at the Geological and Mineralogical Cabinet of the General Land Office, yielding over 30 per cent. of nickel. Nickel was discovered in 1751, by Cronstedt, in Sweden. It is a metal of a color not much differing from that of silver; it is magnetic, soft, and malleable; may be forged, rolled, bored, drawn into wire, &c.; it is more tenacious than iron, and less subject to oxidation than silver. In the year 1824 (the statement may yet be found in Thenard's *Traité de Chimie*), it was stated that the metal, nickel, could not be put to any use. However, it was long before this that nickel was employed by the Chinese for the preparations of an alloy termed by them "Pack-fong;" and, although, in 1776, Englestroem had analyzed this composition, no practical application of this metal was made for some time.

The separation of nickel from its ores is exceedingly difficult and complicated. The crude material is the cobalt speiss and the matt obtained in lead and copper smelting works. In order

to free this material from arsenic and sulphur, it is first finely pulverized and roasted with pulverized coal. The residue is dissolved in muriatic acid, and the solution diluted with much water in order to separate the bismuth. If the liquid is now mixed with hypochlorite of lime, the iron is oxidised to a peroxide, when it may be precipitated with the arsenic acid existing in the liquid. If the liquid is to be freed from copper, a current of hydrogen is conveyed through the same, and, having separated the precipitate produced, the cobalt is thrown down by hypochlorite of lime. Now the nickel may be separated with milk of lime. In subjecting the precipitate, with carbon, to a red heat, the metal may be obtained in its pure state. The manufacture of "Packfong" in Europe is not of a very old date. The term is synonymous with argentum, German-silver, British-plate. Its composition varies considerably, as may be seen from the following table:

	I.	II.	III.	IV.	V.	VI.
Copper	88.00 ..	65.0 ..	43.8 ..	40.4 ..	55.0 ..	50.0
Nickel	8.75 ..	16.8 ..	15.6 ..	31.6 ..	20.0 ..	25.0
Zinc	— ..	13.0 ..	40.6 ..	25.4 ..	25.0 ..	25.0
Iron	1.75 ..	3.4 ..	— ..	2.6 ..	— ..	—
	<u>98.50</u>	<u>98.2</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

It may be seen from this that an alloy may be made with less than 10 per cent. of nickel; but the wearing quality of the metal is decidedly injured by too great a reduction in the quality of nickel.

I will remark that No. 1 is the so-called "white copper," made in Suhl, Germany, a century ago, with copper ores containing nickel, and analyzed by Brandes. No. 2 is an alloy, made at Paris, which is capable of receiving a fine polish or gilding. Nos. 3 and 4 are Chinese packfong. No. 5 is an alloy as used for knife handles. No. 6 is adapted for forks. The nickel coins of Switzerland, which have been in use in that country since 1850, consist of an alloy of nickel, copper, zinc, and silver. The proportion of nickel and zinc in the 20, 10, and 5 centimes pieces is 1.25. While the amount of copper increases with the decreasing value of the coin, the quantity of silver, on the other hand, decreases with the smaller value. Th

United States' coins now in general circulation contain 88 per cent. of copper and 12 per cent. of nickel.

A. R. ROESSLER,

Geologist, General Land Office, Washington.

Jan. 20, 1870. —Journ. Franklin Institute, Feb., 1870.

ON FILTERED AIR.

BY PROFESSOR TYNDALL, F.R.S.*

The theory of disease was never discussed with more earnestness, or with greater precision, than at the present time. The exact methods pursued in physics and chemistry, both as regards reasoning and experiment, are making their influence felt in medicine and surgery; and they promise, while assigning but narrow limits to our present accurate knowledge, to insure its healthy growth. It is, I think, of capital importance to mark each successive step by which that knowledge is surely and certainly augmented; to detach from the domain of vagueness and uncertainty each successive fragment of demonstrated truth. Now, if the published *data* be correct, it seems to me that such a step has been recently taken with reference to the germ theory of the putrefaction of wounds, and that the evidence in favor of that theory amounts to a physical demonstration of its truth. This result and its basis I propose here to describe and define.

The entrance of air into a wound is the dread of the surgeon. When an abscess is opened he must prevent the air from mingling with the blood-clots if he would avoid putrefaction and its teeming accompaniment of animalcule life. Some eminent London surgeons inform me that they never squeeze an abscess, lest when the pressure is relaxed the air should be sucked in. Now, whence this dreaded power? Is it the air itself that causes putrefaction, or is it something carried mechanically by the air? A follower of Gay-Lussac would affirm the former; a heterogenist would refer the animalcules to "spontaneous generation;" a holder of the germ theory would ascribe the putrefaction to seeds or eggs floating in the atmosphere, and which, when sown upon the wound, sprout into this crop of minute organisms. Do

* Contributed to the *Times*, April 7.

any *data* exist which will enable us to say, with certainty, which party is right? I think so.

It would be very difficult to reduce the putrefying power of pure air, even if it existed, to absolute demonstration; for, however cleansed in appearance, a stubborn objector might still urge that the air was not cleansed in reality; that germs exist, though they baffle our attempts to reveal them. But this difficulty does not hamper the other side; for if, notwithstanding the risk of these residual germs, *visibly pure air* can be proved incompetent to produce the phenomena of putrefaction, there is no escape from the inference that, as regards the point to be decided, such air is perfectly filtered; and its proved impotence would be a demonstration of the truth of the germ theory. By "visibly pure air" I mean air which, where traversed by a powerful and intensely concentrated beam of light, in a space not otherwise illuminated, reveals no trace of floating matter to the eye.

How, then, are we to obtain our filtered air, and, having obtained it, how are we to apply it to a wound and mix it effectually with the blood? Two or three years ago an observation and an inference, which, taken together, reflect the highest credit on his sagacity, were made and drawn by Professor Joseph Lister, of Edinburgh. He found, and I believe it is the universal experience of surgery to find, that when the lung is wounded by the spike of a broken rib, air from the pleural cavity may mingle freely with the blood, but that putrefaction never ensues. Here is the statement of Professor Lister, abbreviated, but in his own words:—

"I have explained to my own mind the remarkable fact that in simple fractures of the ribs, if the lung be penetrated by a fragment, the blood effused into the pleural cavity, though freely mixed with air, undergoes no decomposition. The air is sometimes pumped into the pleural cavity in such abundance that, making its way through the wound, it inflates the cellular tissues of the whole body. Yet this occasions (as regards putrefaction) no alarm to the surgeon. Why air introduced into the pleural cavity through a wounded lung should have such wholly different effects from that entering through a permanently open wound penetrating from without, was to me a complete mystery till I heard of the germ theory of putrefaction, when it at once occurred to me that it was only natural that the air should be filtered of germs by the air passages, one of whose offices is to arrest inhaled particles of dust, and prevent them

from entering the air-cells. In truth, this fact in practical surgery, when duly considered, affords as good evidence in support of the germ theory of putrefaction as any experiment that can be performed artificially.*

Here is a surmise which bears upon it the mark of genius, but which nevertheless needs verification. If in the place of the words "it is only natural," we were authorized to write "it is perfectly certain," the demonstration would be complete. Now, this is exactly what experiments with a beam of light enable us to do. One evening towards the close of last year, while pouring various gases across the dust track of a beam in the laboratory of the Royal Institution, the thought occurred to me of displacing by my breath the illuminated dust. I then noticed, for the first time, the extraordinary darkness produced by the air expired towards the end of an expiration. By an intentional effort of expulsion the lungs may be far more effectually emptied of air than by ordinary respiration; and by such an effort, which discharges the air from the interior portion of the lungs into the beam, the darkness is changed to absolute blackness. There is no speck or mote of any kind in such air. It is a true elastic fluid, without a trace of cloud or floating matter.

Thus, by ocular evidence we prove the filtering power of the lungs, and by the experience of surgery we prove the incompetence of air so filtered to produce putrefaction. The germs removed by the process of filtration are therefore the cause of the putrefaction, and its associated phenomena of animalcule life, which was to be demonstrated.

As a guide to the practical surgeon the establishment of this fact is plainly of the very highest importance. Professor Lister now avails himself of the filtering power of cotton wool in treating a numerous class of wounds. He first destroys the germs adherent to the wool, and by a proper lotion he kills those which may be scattered on the flesh. The cleansed wool placed upon the wound permits of a free diffusion of the air, but entirely intercepts the germs, and thus keeps the blood perfectly sweet. It is essential that no matter from the wound should reach the outside air, for such matter would open a highway for the animalcules. I may add that when the foregoing observations on

* *British Medical Journal*, 1868, p. 56.

the filtering power of the lungs were made I had no thought, and but little knowledge, of the germ theory. Their value as evidence is enhanced by the consideration that they are absolutely independent of all theoretic bias.*—*The Chem. and Drug., Lond., May 14, 1870.*

REPORT OF PROF. C. F. CHANDLER TO THE METROPOLITAN BOARD OF HEALTH.

COL. EMMONS CLARK,

Secretary Metropolitan Board of Health.

SIR :—In response to the resolution of the Board, directing “the Chemist to examine the various hair tonics, washes, cosmetics, and other toilet preparations in general use, and to report what ingredients, if any, they contain of a character injurious or dangerous to those who use them,” I beg leave to submit the following report of the results thus far reached. My examination has been specially directed to the mineral poisons; no tests have been as yet made for vegetable or animal substances, as, for example, cantharides, which I have reason to believe is sometimes employed.

The articles which I have examined may be classed as :

- I. Hair tonics, washes, and restoratives.
- II. Lotions for the skin.
- III. Enamels.
- IV. White powders for the skin.

I. HAIR TONICS, WASHES, AND RESTORATIVES.

Of these sixteen have been examined, and, with but one exception, all have been found to contain lead, generally in the form of acetate or sugar of lead.

1. *Hoyt's Hiawatha Hair Restorative.* David Wright, Proprietor, 112 South Street, New York.

This is an ammoniacal solution of nitrate of silver, containing

*The black wreaths produced by placing the flame of a spirit lamp underneath the track of a sunbeam may now be clearly though imperfectly seen in every drawing-room in London. The light, save that passing through a single aperture, ought, as far as possible, to be excluded. A candle flame also shows the effect, but very imperfectly.

4.78 grains of the nitrate in one fluid ounce. It contains no other metals.

2. *Clark's Distilled Restorative for the Hair.* C. G. Clark & Co., Proprietors.

This preparation contains in one fluid ounce :

Lead in solution 0.11 grains.

3. *Chevalier's Life for the Hair.* Prepared by S. A. Chevalier, M.D., 1123 Broadway, New York.

One fluid ounce contains :

Lead in solution 0.22 grains.

Lead in the sediment 0.80 “

Total lead 1.02 “

4. *Pearson & Co.'s Circassian Hair Rejuvenator.* J. S. Pearson & Co., 386 Jay street, Brooklyn, N. Y.

One fluid ounce contains :

Lead in solution 1.40 grains.

Lead in the sediment 1.31 “

Total lead 2.71 “

5. *Ayer's Hair Vigor.* Prepared by J. C. Ayer & Co., Lowell, Mass.

One fluid ounce contains :

Lead in solution 2.81 grains.

Lead in the sediment 0.08 “

Total lead 2.89 “

6. *Prof. Wood's Hair Restorative.* O. J. Wood & Co., 444 Broadway, New York.

One fluid ounce contains :

Lead in solution 2.93 grains.

Lead in the sediment 0.15 “

Total lead 3.08 “

7. *The Hair Restorer of America.* Prepared by Dr. J. J. O'Brien, 202 East 30th street, New York.

One fluid ounce contains :

Lead in solution 3.28 grains.

8. *Gray's Celebrated Hair Restorative.* Day, Hoagland & Stiger, 54 Courtland street, New York.

One fluid ounce contains :

Lead in solution	a trace.
Lead in the sediment	3.39 grains.
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Total lead	3.39 “

9. *Phalon's Vitalia.* Prepared by Phalon & Son, 517 Broadway, New York.

Consists of two fluids in separate bottles.

No. 1 is a clear, pale yellow solution of hyposulphite of soda.

No. 2 is a clear, pale pink solution, containing in one fluid ounce :

Lead	14.08 grains.
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As, by the directions which accompany the package, the lead solution is to be diluted with twice its volume of the hyposulphite solution, the strength of the mixture would be reduced to one-third, when it would contain 4.69 grains of lead in one fluid ounce. Prof. Lawrence Reid, the manufacturers' chemist, claims that the hyposulphite of soda renders the lead harmless by ultimately forming with it an insoluble sulphide of lead, and in various other ways. But after carefully considering all his arguments, I am compelled to say that I cannot accept them as valid.

10. *Ring's Vegetable Ambrosia.* E. M. Tubbs & Co., Proprietors, Peterboro, N. H.

One fluid ounce contains :

Lead in the solution	4.69 grains.
Lead in the sediment	0.31 “
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Total lead	5.00 “

11. *Mrs. S. A. Allen's World's Hair Restorer.* 198 and 200 Greenwich street, New York, and 266 High Holburn, London, England.

One fluid ounce contains :

Lead in solution	5.26 grains.
Lead in the sediment	0.31 “
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Total lead	5.57 “

12. *L. Knittel's Indian Hair Tonic.* Louis Knittel, 616 Eighth avenue, New York.

One fluid ounce contains :

Lead in solution 5.16 grains.

Lead in the sediment 1.13 “

Total lead 6.29 “

13. *Hull's Vegetable Sicilian Hair Renewer.* R. P. Hall & Co., Nashua, N. H.

One fluid ounce contains :

Lead in solution 6.45 grains.

Lead in the sediment 0.68 “

Total lead 7.13 “

14. *Dr. Tebbett's Physiological Hair Regenerator.* Tebbett Bros., Proprietors, Manchester, N. H.

One fluid ounce contains :

Lead in solution 6.82 grains.

Lead in the sediment 0.62 “

Total lead 7.44 “

15. *Martha Washington's Hair Restorative.* Prepared by Simonds & Co., Fitzwilliam, N. H.

One fluid ounce contains :

Lead in solution 3.01 grains.

Lead in the sediment 6.79 “

Total lead 9.80 “

16. *Singer's Hair Restorative.* Depot 643 Broadway, and 79 Nassau street, New York.

One fluid ounce contains :

Lead in solution 0.15 grains.

Lead in the sediment 6.79 “

Total lead 6.94 “

Recapitulation.—Only one of this class of preparations is free from lead, which metal seems indeed to be the *essential constituent* in most cases. Most of the sediments observed in the bottles, and which require that the bottle “*be well shaken*,” etc., con-

sist of sulphur, which it is intended shall ultimately unite with the lead to produce the dark-colored sulphide of lead, or, as one of the manufacturers has it, "*the original youthful beauty and color.*" The following tabular statement shows how the poisonous hair nostrums compare among themselves :

Grains of Lead in one fluid ounce.

1. Clark's Distilled Restorative for the Hair	0·11
2. Chevalier's Life for the Hair	1·02
3. Circassian Hair Rejuvenator	2·71
4. Ayer's Hair Vigor	2·89
5. Prof. Wood's Hair Restorative	3·08
6. Dr. J. J. O'Brien's Hair Restorer of America	3·28
7. Gray's Celebrated Hair Restorative	3·39
8. Phalon's Vitalia	4·69
9. Ring's Vegetable Ambrosia	5·00
10. Mrs. S. A. Allen's World's Hair Restorer	5·57
11. L. Knittel's Indian Hair Tonique	6·29
12. Hall's Vegetable Sicilian Hair Renewer	7·13
13. Dr. Tebbett's Physiological Hair Regenerator	7·44
14. Martha Washington's Hair Restorative	9·80
15. Singer's Hair Restorative	16·39

II. LOTIONS OR WASHES FOR THE COMPLEXION.

1. *Burnett's Kalliston.* Joseph Burnett & Co., Boston, Mass. Contains no injurious metals.

2. *Phalon's Paphian Lotion, or Floral Beautifier.* Phalon & Son, 517 Broadway, New York. Contains no injurious metals.

3. *Enamel of America.* Francois Gregoire & Co., cor. of Eighth and Locust streets, Phila. A clear, colorless liquid, containing no injurious metals.

4. *Email de Paris, de Jared.* Jared et Renf, Paris. A pink alcoholic liquid, free from injurious metals.

5. *Balm of a Thousand Flowers.* A thick yellow emulsion, free from injurious metals.

6. *Perry's Moth and Freckle Lotion.* Dr. B. C. Perry, 49 Bond street, New York.

A colorless liquid, with a little white sediment.

One fluid ounce contains :

Mercury in solution	.	.	.	2.67 grains.
Zinc " "	.	.	.	0.99 "

Equivalent to—

Corrosive sublimate	.	.	.	3.61 "
Sulphate of zinc (crystallized)	.	.	.	4.25 "

The sediment contains a little mercury, lead, and bismuth.

Recapitulation.—With the exception of Perry's Moth and Freckle Lotion, these lotions are entirely free from lead or other injurious metals.

III. ENAMELS FOR THE SKIN.

1. *Balm of White Lilies, for preserving and beautifying the skin.* H. A. Hoadley, New York.

Water colored pink, and holding in suspension a large amount of carbonate of lime. It does not contain any injurious metals.

2. *Dr. Bradford's Enameline for the Complexion.*

A colorless liquid, holding 33.02 grains of oxide of zinc in suspension in each fluid ounce. Is free from lead.

3. *Hagan's Magnolia Balm.* Demas Barnes & Co., New York.

A colorless liquid, holding in suspension in each fluid ounce 118.61 grains of oxide of zinc. Is free from lead.

4. *Laird's Bloom of Youth, or Liquid Pearl.* Geo. W. Laird, 74 Fulton street, New York.

A colorless liquid, holding in suspension in each fluid ounce 169 grains of oxide of zinc. It is entirely free from lead.

5. *Eugénie's Favorite.* M^lles T. & L. Jouvin, late of Rue St. Anne, Paris.

A colorless solution, holding in suspension in each fluid ounce 140.52 grains of carbonate of lead, *white lead*, containing 108.94 grains of metallic lead. There is a trace of lead dissolved in the liquid.

6. *Snow-white Enamel, for Whitening and Beautifying the Complexion.* Phalon & Sons, 517 Broadway, New York.

A colorless liquid, holding in suspension in each fluid ounce 186.67 grains of carbonate of lead, equivalent to

Metallic lead in sediment.	144.72 grains.
Lead in solution	1.56 “

Total lead 146.28 “

7. *Snow-white Oriental Cream, for Whitening and Beautifying the Complexion.* Phalon & Sons, 517 Broadway New York.

A colorless liquid, holding in suspension in each fluid ounce 246 grains of carbonate of lead; equivalent to

Lead in suspension	190.22 grains.
Lead in solution	0.77 “

Total lead 190.99 “

Recapitulation. The Enamels consist of white powders suspended in clear liquids; on standing the powders subside, but agitation quickly incorporates them with the liquids again. The following contain lead, mostly, if not entirely, in the form of carbonate; they are therefore simply “white lead” ground in water.

Grains of lead in one fluid ounce after shaking.

Eugénie's Favorite	108.94 grains.
Phalon's Snow-white Enamel	146.28 “
Phalon's Snow-white Oriental Cream	190.99 “

IV. WHITE POWDERS FOR THE SKIN.

1. *John Irvine's Compound Chinese Tablet of Alabaster* consists of carbonate of lime, free from injurious metals.

2. *Shand's Compound Chinese Tablet of Alabaster* consists of carbonate of lime, free from injurious metals.

3. *Superior Lily White*, X. Bazin, Philadelphia, consists of carbonate of lime and carbonate of magnesia, free from injurious metals.

4. *Cascarilla de Caracol de Persia*, R. & C. A. Wright, Philadelphia, consists of carbonate of lime, and some earthy matter insoluble in acids, either clay or “French chalk;” is free from injurious metals.

5. *The Original Tablet of Alabaster, or Lily White Cosmetic*, consists of carbonate of lime, with some clay or “French chalk;” is free from injurious metals.

6. *Bismuth Powder for Beautifying the Skin and removing Freckles* consists of carbonate of lime, with much clay or "French chalk;" is free from injurious metals.

7. *Lavel's Lily White and Rose Bloom* consists of clay or "French chalk;" is free from injurious metals.

Recapitulation.—The white powders consist of carbonate of lime, carbonate of magnesia, clay, or "French chalk;" either singly or mixed. Nothing injurious was detected in any one of them.

Conclusion.—It appears from the foregoing:—

1. The *Hair Tonics, Washes and Restoratives* contain lead in considerable quantities; that they owe their action to this metal, and that they are consequently highly dangerous to the health of persons using them.

2. With a single exception, Perry's Moth and Freckle Lotion, which contains corrosive sublimate, the *Lotions* for the skin are free from lead and other injurious metals.

3. That the *Enamels* are composed of either carbonate of lime, oxide of zinc, or carbonate of lead, suspended in water. The first two classes of enamels are comparatively harmless, as harmless as any other white dirt when plastered over the skin to close the pores and prevent its healthy action. On the other hand, the enamels composed of carbonate of lead are highly dangerous, and their use is very certain to produce disastrous results to those who patronize them.

4. The white powders for the skin are harmless, except in so far as their application may interfere with the healthy action of the skin.

Respectfully submitted,

C. F. CHANDLER, Ph.D.

Chemist to the Metropolitan Board of Health.

ON BENZOIC ACID AND GUM BENZOIN.

BY JULIUS LÖWE.

The contents of this paper are the answers given to four queries, viz.:—(1) Does benzoic acid pre-exist in gum-benzoin ready-formed and in free state? (2) Is the benzoic acid present in the resin combined with a base? (3) Is benzoic acid a pro-

duct of the oxidation of a part of the resin formed by the taking up of oxygen during the melting of the resin? (4) Is benzoic acid a product of a portion of the resin formed by the heat of the fusion of that substance? The author's experiments, detailed at great length, commenced with the finding of a reply to No. 3, and the result is a negative—viz., that when the process of sublimation (as usually employed for obtaining benzoic acid from gum benzoin) is carried on in atmospheres of hydrogen or carbonic acid gas, the quantity and quality of the acid obtained are the same as when the process is carried on in contact with air. As regards the replies to Nos. 1, 2, and 4, a series of experiments made in various ways proved, undoubtedly, the pre-existence of ready-formed benzoic acid in the resin. The last portion of this paper is devoted to the very minutely detailed description of the best practical method of the preparation of benzoic acid from the resin.—*Chem. News, Lond., March 25, 1870.*

CHEMICAL CONSTITUENTS OF THE ASPARAGUS BERRIES.

By H. REINSCH.

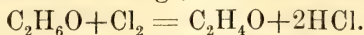
Our readers are all acquainted with the vegetable known as asparagus; they also know that, when this plant comes to full development towards the latter end of the summer, it produces berries of the size of medium green peas, of dark red color, and a waxy appearance. The author has instituted some experiments, and investigated the nature of these berries, which enclose four black-colored, somewhat angular-shaped, internally greenish seeds, made up of a horny material, like raw coffee, but far more tough than the latter, because, after drying, the asparagus seeds cannot be pulverized in a mortar. The author has collected a sufficient quantity of the berries to try whether the seeds might be used as a substitute for coffee. For this purpose the berries are bruised, and left to ferment for some days. The seeds are separated from the pulpy mass by means of a sieve; next washed with water; dried and roasted in the same way as coffee. The author made a mixture of equal parts of coffee and asparagus seeds, which, after roasting, was not, when infused with boiling-water, in the least distinguishable from ex-

cellent coffee. The berries contain a large amount of glucose (grape sugar), and may, consequently, be used for the production of spirits, after fermentation. Of far more importance, however, may be a substance which the author has discovered in the berries,—viz., the pigment contained therein, and named spargancine—a yellowish red coloring matter, soluble in alcohol and ether, and yielding, with salts of lead and alumina, yellow-colored pigments. The author's researches on this subject are not complete, owing to want of sufficient raw material. As regards the horny seeds they contain oil, grape sugar, a peculiarly bitter principle, spargine, some resin, and a coloring matter. It appears that the crop of asparagus berries (at least, in the neighborhood of Nürnberg, Bavaria, where the author resides) is very large; a single plant yielded more than $\frac{1}{2}$ lb. of berries.—*Chem. News, Lond., May 6, 1870.*

A NEW CHLORAL.

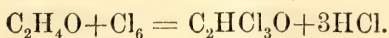
Dr. Hofmann, who was present at the last meeting of the Chemical Society, related some interesting facts connected with the manufacture of chloral in Berlin.

It appears that in many of the German distilleries the crude spirit is purified by filtration through a deep bed of charcoal. In consequence of the adoption of this method a considerable quantity of aldehyd is generated in the spirit; and in these distilleries a certain portion of the produce is so far contaminated with this substance as to be unfit for any of the uses of spirit of wine. Since the manufacture of chloral has become a matter of so much importance (Dr. Hofmann states that one maker in Berlin is producing a hundred pounds per day), it appeared likely that this spirit, containing aldehyd, would find an economic application. The formula of chloral indicates that it is the chlorine derivative of aldehyd, and the first action of chlorine upon alcohol is to remove two atoms of hydrogen, liberating aldehyd, which, by a substitution change, is then converted into chloral:



Alcohol.

Aldehyd.

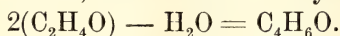


Aldehyd.

Chloral.

The presence of aldehyd in alcohol ought, therefore, to be no detriment to its use in the preparation of chloral. Nevertheless, it was found that the product obtained from this spirit differed in some respects from the ordinary chloral. Analysis proved that it contained a distinct substance.

It has been shown that when aldehyd is subjected to the action of hydrochloric acid gas, two molecules of it are deprived of the elements of water, and crotonic aldehyd results:—



The hydrochloric acid resulting from the first part of the action therefore attacked the free aldehyd, and produced this change. By the further action of chlorine upon this crotonic aldehyd a chlorine derivative was obtained, having the composition $\text{C}_4\text{H}_3\text{Cl}_3\text{O}$. Whether this body possesses the same medicinal properties as the ordinary chloral has not been determined.—*Pharm. Journ., Lond., May, 1870.*

ESTIMATION OF THE VALUE OF THE VARIOUS KINDS OF CINCHONA BARK.

BY DR. A. E. VOGL.

Forty grms. of the previously-pulverized bark are intimately mixed with ten grms. of quick-lime, and made into a thin paste with water; and this mixture is dried (the temperature is not stated). The dried mass is pulverized, and repeatedly exhausted with boiling alcohol at 90 per cent. (600 c.c. are a sufficient quantity for this purpose); the alcoholic solution is filtered, and to the filtrate are added about 5 c.c. of dilute sulphuric acid. The ensuing precipitate of gypsum having been removed by filtration, the alcoholic fluid is submitted to distillation, and, after having been greatly reduced in bulk, is further evaporated to a very small bulk on a water-bath, whereby a flocculent, resinous, vanilla-like smelling aromatic substance is precipitated. After this material is again removed by filtration, to the filtrate is added a sufficient quantity of a solution of caustic soda as is required for the precipitation of all the alkaloids contained in the bark. These bodies are, by this mode of treatment, obtained in a high degree of purity in the shape of a white caseous, or crystallino flocculent precipitate; this should be collected on a previously

tared filter, washed with the smallest possible quantity of water, and thoroughly dried, and next weighed. In order to separate the different bases from each other, the aforesaid precipitate is digested for twenty-four hours in a small flask with about 5 c.c. of ether. The ethereal solution is filtered off from the insoluble residue, which is first washed with ether, and next dissolved in alcohol. Each of the solutions so obtained is evaporated, yielding, in some instances, an amorphous, in others, a crystalline residue. These residues are dissolved in dilute sulphuric acid; and, after these solutions have been filtered, the alkaloids are precipitated from these solutions by means of a caustic soda solution, which has been titrated so as to correspond with the dilute sulphuric acid applied as just stated. This method of the estimation of the value of the cinchona barks is recommended by the author for the reason—(1) that it is easily and rapidly executed; (2) because it affords complete exhaustion of the valuable constituents of the bark, with very little, if any, loss; (3) because the bases are obtained directly in a high degree of purity. There are appended to this paper a series of results of analyses of various kinds of barks, made partly by this and partly by other well known methods, as devised by scientific men who, like Dr. de Vrij, Dr. Rabourdin, and Prof. Schneider, are high authorities on this subject. From the results here published, this method deserves every praise.—*Chem. News, Lond., April 14, 1870.*

ON THE CULTIVATION OF SAFFRON.

THE saffron whose stigmas find a use in pharmaceutical preparations, is cultivated in Gatinais (Loiret), and in the neighborhood of Orange and Carpentier (Vaucluse), in France. The plant requires a soil of very good quality, containing much sand and lime, so that water will be readily absorbed, and after evaporation leave the soil again in a loose, not lumpy, condition. It is a soil similar to that employed in southern France for the cultivation of madder, and presents hardly any obstacles to the young rootlets, which is a necessary requirement for the successful growth of the plant.

After a series of rather delicate operations, which tend to break up and prepare the soil, the bulbs are planted in the first half of

July, at distances of three-quarters of an inch, in rows, which are separated from each other about one foot. These bulbs remain in the earth for three years. The flowers appear in October, and are especially plentiful in the second year. They are gathered by hand and put in baskets to wither, without allowing them to be pressed. The harvest lasts from a fortnight to three or four weeks, and yields, on an average, three flowers from each bulb. Seven to eight thousand flowers are counted for one pound of fresh saffron, which will lose four fifths of its weight by drying. One pound of the dried saffron of commerce will therefore represent 35,000 to 40,000 flowers. Immediately after gathering, the stigmas are removed from the flowers, and, without mixing the stamina, are put in small heaps. This part of the work is performed by women, children, and old men, and on account of the powerfully stupefying odor, as much as possible in the open air.

The drying of the saffron is effected by hanging it, distributed on a hair sieve, over a low coal fire. After fifteen minutes the stigmas are stirred up and heated again. When dry the contents of the sieve are put on a large plate, not exposed to moisture, and allowed to get cold, when they are filled in well-dried linen bags, which are kept at a dry place.—*Drug. Cir. & Chem. Gaz.*, May, 1870, from *Jour. Pharm. Chem.*

AMBROSINE.

A NEW fossil resin, found in the phosphate beds of South Carolina, is thus described by Prof. Chas. U. Sheppard, in the *Rural Carolinian*:—"An irregular oval-shaped mass of a mineral closely resembling amber, has been brought to my notice. The mass was originally of the size of a man's fist. It is of a yellowish-brown color externally, but within is clove-brown. It breaks with about the same facility as amber; has a conchoidal fracture, and a resinous lustre. It is feebly translucent. Its specific gravity is but slightly above that of water. Indeed, small fragments of it, when thrown into water, float for a short time, until they part with adhering air, when they slowly descend through the liquid. It is strongly electric by friction. It melts into a clear yellowish liquid at about 460° Fah. It gives off succinic acid before it melts. On fusion a dense yellow oil is volatilized, attended with

an agreeable balsamic odor, wholly unlike that from the resins of our pines.

As it differs from any of the oxygenated hydrocarbons known, I have called it ambrosine—from the two words amber and resin; to both of which substances it bears a resemblance. It is very combustible, burning with a bright yellowish white light, a pleasant odor, and without leaving any carbon, or even the slightest ash behind. It is largely soluble in oil of turpentine, alcohol, ether, and chloroform, as well as in a solution of potash; and is feebly taken up by the strong acids without suffering decomposition. It probably originated in some of the coniferous trees that existed during the pliocene epoch, when our phosphatic formation was in progress of deposition.”—*Drug. Cir. & Chem. Gaz.*, May, 1870.

Minutes of the Philadelphia College of Pharmacy.

A stated meeting of the College was held at the College Hall, June 27th, 1870, the President, Dillwyn Parrish, in the Chair.

The minutes of the preceding meeting were read and adopted.

The minutes of the Board of Trustees were read by Alfred B. Taylor, Secretary of the Board, and approved.

The Committee on Latin Labels, not being ready to report, was continued.

The Publishing Committee, in the matter relative to the distribution of the Journal, referred to them at the last meeting, reported that it had been attended to.

The Treasurer of the Building Committee reported that he had paid over the balance in his hands to the Chairman of the Sinking Fund Committee, as directed at the last meeting.

The report of the Delegates to the National Convention for Revising the Pharmacopœia, held at Washington, on the 4th of May last, was given by Alfred B. Taylor. The Convention was duly held; about forty delegates were commissioned, of whom about thirty attended. Prof. Carson, of Philadelphia, was chosen President, and Dr. Miller, of Washington, and William Procter, Jr., Vice-Presidents, and Dr. Riley, Secretary. Contributions toward the revision of the Pharmacopœia were handed in from the Chicago College of Pharmacy, the Baltimore College of Pharmacy, the College of Physicians of Philadelphia, the Philadelphia College of Pharmacy and the Medical Society of the State of New York. These were referred to a Committee to report a plan for the Revision of the Pharmacopœia of 1870, which Committee, on the following day, reported a series of resolutions; most of which were adopted. Among

these was one abolishing measures of capacity from the Pharmacopœia, and another giving the Committee power to issue a new edition, if necessary, before 1880. A Committee of fifteen was then appointed to accomplish the Revision, of which Prof. Carson was made Chairman, and the Committee directed to meet in Philadelphia. Six members of the Committee residing there, and the working quorum of the Committee fixed at three. [A full report of the proceedings will be found at page 289.]

Letters were received from Prof. Joseph Carson, of the University of Pennsylvania, and Prof. John Atfield, of the Pharmaceutical Society at London, acknowledging their election to honorary membership in the College.

Proposition for membership No. 1 was referred to a Committee consisting of Messrs. Procter, Wiegand and Taylor.

The appointment of delegates to attend the American Pharmaceutical Association being in order, the following were appointed to represent this College: William Procter, Jr., Alfred B. Taylor, Joseph P. Remington, Charles Bullock and Prof. Robert Bridges, with power to fill vacancies.

The following delegates to attend the Conference of the Colleges of Pharmacy, to be held in Baltimore, in reference to Pharmaceutical Education, were appointed, viz.: Prof. Robert Bridges, *Chairman*, Prof. John M. Maisch, Prof. Edward Parrish, William Procter, Jr., and Alfred B. Taylor.

The meeting then adjourned.

C. BULLOCK, *Sec'y*.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—For the first time we have failed to receive an official notice from the President for announcement in our July number. The time for the convening of this body (September 13th) is rapidly approaching, and the central position of Baltimore will probably attract a large gathering of the members. The opportunity of again meeting with us will be afforded to the old Southern members, and we hope many new ones. The subjects of local pharmaceutical organization, and of legislation for pharmacy, are now prominent points, and will probably receive due attention at the meeting. There is no doubt of the usefulness of local organization; with or without the accompaniment of a school, it affords a central rallying point for scientific and professional interests, and when accompanied by library and museum accommodations becomes at once something to work for and to be interested in, outside of strictly personal interests. The appointment

of a successor to Prof. J. M. Maisch, who has resigned the permanent secretaryship, will be one of the most important acts of the meeting, and one that will have to be attended to promptly and wisely, as much of the usefulness of the Association depends on the devotedness of that official to its interests in the interim. The financial condition of the Association is another highly important subject. Without money it is certain that the present scope of the Association cannot be continued. The demand from each member is not much, but in the aggregate it is sufficient to carry on the operations of the body. Let that little then be promptly and gracefully paid in aid of the objects in which we all should cooperate. Those that go to the meetings pay a much heavier contribution than those who stay; all are welcome, yet when for any reason a member cannot go, let him cheerfully remember that his annual contribution is an active agent in pushing onward the wheels of progress.

Coincident with this meeting will be a Congress of Delegates from Colleges of Pharmacy relative to pharmaceutical education in the United States, and more especially in reference to the attainment of a uniform standard of qualification for graduates.

CARELESS REPORTING OF THE PHARMACOPEIAL CONVENTION BY THE MEDICAL JOURNALS.—If anything was needed to prove the small hold which the Pharmacopœia of the United States has on the medical profession, one evidence may be seen in the manner of alluding to it by the medical Journals. The *Medical Gazette*, N. York, calls it the "American Pharmaceutical Association, and says, the "sixth decennial convention was held," &c. Other journals have been equally careless, and appear to overlook the fact that, until the Pharmacopœia becomes thoroughly authoritative as a code of medical recipes and pharmaceutical preparations, equally respected in practice by physicians and pharmacutists, it is useless to expect a cessation of complaints and disappointments in the intercourse between physicians and apothecaries.

THE SCHOOLS OF PHARMACY.—From what we have learned through regular announcements and otherwise their will be six schools of pharmacy in operation the coming season, under the direction of Colleges of Pharmacy, besides several that are attached to other institutions. Competition is having a good effect, and a generous rivalry in the direction of a better system of instruction will raise the standard value of the diploma. There is a serious want of instruction in analytical and practical pharmaceutical chemistry in the college schools, arising from a difficulty on the part of those engaged in pharmaceutical pursuits to get the time and means; and unless made obligatory, as a condition of graduation and consequently of apprenticeship, there seems no way of securing these branches a place in the curriculum. We have been informed that Mr. Henry C. Lea is about to publish an American Edition of Attfield's

Chemistry, under the supervision of the author, who will adapt it to our Pharmacopœia. This will be a good text-book for our Colleges, who may institute practical schools, and will also be a most valuable aid to home students in the shop, to direct their efforts at gaining a knowledge of practical chemistry by their own efforts. It is not to be expected that a large proportion of students of pharmacy can get the tuition they need in college schools, and it is time that some efforts should be directed by disinterested members of our profession towards encouraging this home effort among the present generation of apprentices and assistants.

THE SCIENTIFIC SOIREE OF THE BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES of Philadelphia, was held at the hall of the College of Physicians, Thirteenth and Locust, on Friday evening, May 13th. The occasion will long be remembered as one of the most brilliant and successful gatherings ever convened to popularize science. The exhibition consisted of anatomical and physiological specimens and models in the upper east room, of a most extensive collection of microscopes, each with an object ready for examination arranged around a series of tables to facilitate their inspection by the crowd of visitors in the library apartment. This was under the direction of Dr. Tyson and Mr. Walmsley and several other gentlemen, and was a rare treat from the variety and rarity of the specimens and the excellence of many of the instruments. In the lower east room Prof. Robert E. Rodgers exhibited a variety of electric and electro-magnetic experiments, and in the west room Dr. J. S. Cohen had charge of instruments illustrating sound and the vibrations on which it depends. In the lecture room Dr. J. Gibbons Hunt exhibited a great variety of microphotographs of animal and vegetable structure, and many other views, by means of the gas microscope and stereopticon. The rooms were open from half-past 7 until 11 o'clock, and most of the time were crowded with a company representing the most intelligent class of society, a large proportion of whom were ladies. The microscopes, numbering more than eighty, certainly were most attractive and many of them were instruments of great power, including several that were binocular. The upper and lower halls were decorated with exotic plants and flowers, and the whole brilliantly lighted. The Directors, Dr. S. Wier Mitchell and Dr. Wm. Pepper, and their aids, were unceasing in their efforts to add to the interest and satisfaction of the visitors, and all passed off satisfactorily.

METRIC WEIGHTS AND MEASURES.—We learn through the *Chemist and Druggist*, that at a meeting of the "International Decimal Association, held at the rooms of the Society of Arts, Sir Charles Adderly, M.P., moved the following resolution: "That the great inconvenience to agriculture, manufacturers and commerce, as well as to science, resulting from the numerous complicated and anomalous weights and measures now

in use, whether by law or custom, in the British empire, demands the attention of the Legislature at the earliest practical time, with a view to the establishment of some convenient uniform decimal system throughout the United Kingdom." Which resolution was carried, but two speakers being in the negative. One of these, however, was Prof. Airey, the Astronomer-Royal, who spoke in favor of the English weights and measures as more useful in practice from their ready subdivision by halving and quartering. They also recommended the substitution of metrical for troy weights, it having been recommended to abolish the latter by the Standard Commissioners, and thus make an entering wedge to their general introduction. They also advocate the system of international coinage, based on gold of nine-tenths purity, with a decimal division.

PROF. LIEBIG.—From a notice in *Cosmos*, June 4th, this savant has been seriously ill from a dangerous abscess in the neck, requiring a surgical operation. The paper considered his recovery doubtful; but as nothing has yet been announced, we presume this eminent and useful laborer in science has recovered.

PEPSINE.—The following query, received sometime ago, was accidentally overlooked:

Philadelphia, 3d mo. 19th, 1870.

Dear Sir :—Through the pages of the *Journal of Pharmacy* at its next issue will you oblige a subscriber by replying to this query: In the preparation of "pepsine," by the method of Boudault, is the product in any way injured if the solution, after treatment with sulphuretted hydrogen, is filtered through *carbo animalis*, a step which seems necessary to free it from the sulphuret of lead prior to evaporation?

A SUBSCRIBER.

The treatment of pepsine in solution with a moderate quantity of animal charcoal will cause no material loss, and will remove its odor. As the object is deodorization and *not* decoloration, the smallest quantity suitable to remove the odor will be best.

PHARMACY IN NEW JERSEY.—Our New Jersey friends are in earnest in pushing the organization of their body. In our May number a notice was given of the initial meeting at Newark, Feb. 24th. The Secretary, Mr. Charles B. Smith, in a letter dated May 27th, sends several copies of the proposed law, as adopted at the meeting held in Trenton on the 24th of March, to which he alludes in the following extract:

"At the meeting held in Trenton, March 24th, 1870, one member from each County in the State was added to the Legislative Committee.

"The Chairman of that Committee was directed to have printed five hundred copies of the law as amended, and to place one copy in the hand of every druggist in the State, with the request to return them with their written approval or objection any time before July 1st. Upon those

returned copies the Committee will report at a special meeting to be held at Long Branch, Wednesday, August 17th, 1870."

The proposed New Jersey Law is mainly that of the American Pharmaceutical Association reported in September last, with certain modifications, rendered necessary by the circumstances of New Jersey. It embraces registration, the sale of poisons and the adulteration of drugs. When the meeting of August has determined the deliberate sentiment of the members in regard to the law, some changes may occur, and then it will probably be offered for Legislative action.

WEST VIRGINIA PHARMACEUTICAL ASSOCIATION.—The following circular has been distributed and the druggists of West Virginia invited to take part in the movement, at a meeting named for April 26th ult., at Wheeling, Va. It was signed by H. Treverton Bond, *Sec. pro tem.* We have not heard the result :

We, the undersigned Practical Druggists, desirous of promoting the cause of Pharmacy in our midst, do hereby agree to form an Association to be known as the "*West Virginia Pharmaceutical Association*," having for its object the cultivation, improvement and dissemination of a knowledge of Pharmacy and its collateral branches of sciences, and of giving instruction in the same, by such method as may hereafter be determined upon.

Edmund Bocking,	T. H. Logan,	C. R. Hubbard,
R. B. McLain,	Samuel Laughlin,	James Reed,
H. Treverton Bond,	Jas. Murray,	F. L. Braun,
Thos. J. Finney,	John List	J. H. Silvey,
G. W. C. Carroll,	S. L. Brice,	Samuel Owen,
Jno. G. McLain.		

PHARMACY IN INDIANA.—*The Daily Gazette*, of Fort Wayne, Indiana, of June 21, 1870, gives the proceedings of a meeting to organize a Pharmaceutical Association held at the City Clerk's office on the preceding evening. Mr. Wagner was chosen temporary chairman. After some discussion Mr. Sweringen was elected *permanent* President, Mr. Biddle Vice-president, Mr. G. J. Mayer Secretary, and Mr. Nill Treasurer.

A committee, consisting of Messrs. Marshall, Wagner, Nill, Meyer and Zimmermann, was appointed to draft a constitution and by-laws, and report to the next meeting. On motion of Mr. Marshall, and after a lively discussion, it was resolved to call the organization "*The Indiana Pharmaceutical Association*;" when the meeting adjourned to meet on the 27th of June next.

CHINESE PHARMACY IN NEW YORK.—According to the *Med. and Surg. Reporter*, of Philadelphia, "*Lum Ling Wan*, a native Chinese physician, proposes to settle in New York and enter upon the practice of his profession. He brings with him his wife, an interpreter, *Lu Sing*, two Chinese apothecaries, *Ah Mok* and *Ah Sam*, and an endless assortment of drugs and medicines." It is said that in China physicians are paid

pending the continued health of their patients, the fees ceasing on the appearance of sickness. It may be doubted whether this plan would suit in New York.

ADVERTISING SHEET OF THE AMERICAN JOURNAL OF PHARMACY.—The Publishing Committee have determined to issue the advertising sheet appended to this Journal every month, so as to offer a more favorable medium for business men. On those months intermediate between the usual issues of the Journal, viz., February, April, June, August, October and December, the Advertiser will appear separately, accompanied by a small news leaf, and probably with a price current. This arrangement, which will begin with August, but will probably not be in good working order until January, will enable the Editor to announce recent pharmaceutical news every month, and, as it is our wish to keep the sheet for legitimate advertisements in the drug and chemical and pharmaceutical trade, the book trade, scientific and medical institution school notices, with a corner for clerks and employers, and another for advertising the sale of stores, etc.; it is believed that an excellent medium will thus be afforded for clerks, assistants, apprentices and employers to communicate with each other. The terms under the new arrangement will be stated in the August sheet.

HYDRATE OF CHLORAL.—Albert DUNG & Co., agents for Dr. Liebreich's hydrate of chloral, as manufactured at Berlin, has sent us a sample for examination. It has been subjected to tests with success and has been used therapeutically by several physicians with satisfaction. It is in crystalline cubical masses like spermaceti, is soluble in its own weight of water, is unaffected by nitrate of silver, permanganate of potassa is unchanged by it as suggested by Dr. Rieckher.

This notice should have appeared in May, but was crowded out.

MASSACHUSETTS COLLEGE OF PHARMACY.—The Second Annual Commencement of this Institution was held in Boston on June 22d. when Charles Harrison Bassett, Joseph Howes Dyer, Edward Samuel Kelley, Horace Augustus Prescott, George Estus Raymore and James Stewart Talbot received its Diploma. Valedictory by Prof. Cyrus M. Tracy. On the 24th of June an Alumni Association was formed and the following officers chosen:—G. F. H. Markoe, *President*; H. W. Lincoln and J. T. Brown, Jr., *Vice Presidents*; T. Dolber, *Secretary*; C. H. Bassett, *Treasurer*.

DR. SIMPSON'S REPLY TO DR. BIGELOW.—The Journal of the Gynæcological Society of Boston publishes this letter in a supplement to the May number. It is probably the last paper of the distinguished author, and as giving the views and belief of one largely concerned in the *history* of anæsthesia is worthy a careful perusal. As we have not read the letter

of Dr. Bigelow, any remarks in that direction would be out of place, but we may be warranted in saying that Dr. Simpson's views of the claims of Dr. Horace Wells, as initiating the series of experiments and arguments that resulted in the discovery of anæsthesia, as a great ameliorator in surgical operations, agrees with our own; for though dentistry is a distinct profession, yet the extraction of teeth is as much a surgical operation as any other act that excises or removes an organ or part of the human body, involving pain. The failure of Wells at first to manipulate satisfactorily with nitrous oxide, lead Morton to look around for a better agent, and in doing so to seek the chemical aid of Dr. Jackson. The new agent, ether, was successful, and surgical anæsthesia was proclaimed to the world as a great fact and was duly acknowledged. Practical anæsthesia having thus become, through American minds, the property of mankind, it was just and proper that all the world should strive to extend its benefits, and certainly one of the greatest and most earnest of these strivers was Dr. Simpson; first, in his application of ethereal anæsthesia to midwifery, and then, in the pursuit of this idea, his recognition and application of the anæsthetic properties of chloroform. That anæsthesia should be effected more through chloroform than ether, in Europe, is not surprising, or that ether, or a mixture, should be most used here. Certainly the record, as regards accidents, is against chloroform and in favor of the safety of ether.

CYCLOPÆDIA OF QUANTITATIVE CHEMICAL ANALYSIS, by Frank H. Storer.—The first sheet, as a sample of this work, has been received. No programme or explanation came with it. The presumption is that the Author proposes its publication. If carried out in the manner of the sheet sent it will be a valuable compendium of analytical information, arranged alphabetically.

DR. ATTFIELD'S SATURATION TABLES.—The Editor acknowledges the reception of a copy of these tables from Mr. H. Silverlock, 92 Blackfriars road, London. This chart is copied from Attfield's Pharmaceutical Chemistry, and is a useful aid to the dispenser when placed in a position for ready reference.

OBITUARY.

CHARLES B. NOTSON, pharmacist, formerly of Philadelphia, died at St. Josephs, Missouri, on the morning of the 17th of April last, in the 31st year of his age, of a severe affection of the throat. Mr. Notson was the son of Dr. Wm. Notson of this city. He studied pharmacy here and graduated at the Philadelphia College of Pharmacy in March, 1865. He settled in St. Josephs in 1868, in the drug business, in partnership with Mr. Brokaw, with decided success. On the formation of the Pharmaceutical Association of St. Josephs, in February last, Charles B. Notson

was elected its Vice-President, and was in good esteem among his brethren as an able pharmacist and an honorable and worthy member of the community. Mr. Notson leaves a widow and daughter, having married about two years since.

At a meeting of the Pharmaceutical Association of St. Josephs, that body passed resolutions appreciative of the deceased and sympathizing with his family.

SAMUEL LENHER, Pharmaceutist of Philadelphia, died of disease of the heart, on the evening of the 20th inst., in the forty-sixth year of his age.

Mr. Lenher's first connection with our business was in a store where the opportunities for education were so meagre, and the character of the employment so distasteful that he had determined to make a change, which he soon after carried into effect, as he found a situation in the establishment of the late Frederick Brown, where he continued his studies and graduated after a term of four years apprenticeship.

His connection with Mr. Brown was an unusually long one, lasting between sixteen and seventeen years, an evidence of the high estimate that his acute preceptor set upon his services; he was for twelve years the chief assistant in the establishment, and to his scientific knowledge and attention to business much of the superiority of his employers pharmacy must be attributed. A remarkable aptitude for mechanics enabled him to design and execute apparatus that proved very valuable in business; it is to be regretted that his modesty and retiring disposition prevented him from becoming better acquainted with his pharmaceutical brethren, and them from learning much that he would have been pleased to communicate.

To those who were well acquainted with him, he was gentle and pleasant in manners, while free and decided in the expression of his opinions; but it was in the relations of son and brother his character was most beautifully manifested by the affection he ever evinced for his family.

For the last few months his health, which had been seriously impaired by too close attention to a business we all know permits far too little time for relaxation, gave way and he gradually sunk after great suffering.

T. S. W.

SIR JAMES YOUNG SIMPSON. "The death of the distinguished discoverer of the anæsthetical properties of chloroform, Sir James Y. Simpson, at Edinburgh, on the 8th of May, of angina pectoris complicated with heart disease, in his 59th year, is announced by cable. Dr. Simpson was born in the year 1811, in Bathgate, Linlithgowshire, Scotland. He received his education in the University of Edinburgh, from which he graduated in 1832 with the degree of M.D. Immediately after graduating he was appointed an assistant to Professor Thomson of the University, and he proved his eminent fitness for the position by an able series of lectures which he delivered during the illness of his principal, in 1836. In 1840 Dr. Simpson was elected to the Professorship of Midwifery in the Edin-

burgh University, and this position he held during the remainder of his life. It was on the 19th of January, 1847, that he first applied anæsthesia to midwifery practice, and his subsequent investigations in the same direction led to the discovery of the anæsthetical properties of chloroform. The importance of these investigations can scarcely be overestimated, and they have completely revolutionized some of the features of medical and surgical practice. Dr. Simpson was elected President of the Edinburgh Royal College of Physicians in 1849, and in 1852 President of the Medico-Chirurgical Society. In 1853 the French Academy of Medicine complimented him by electing him a Foreign Associate, and a still higher compliment was paid him in 1856 by the award of the "Monthyon Prize," of 2000 francs, by the French Academy of Sciences, in consideration of the benefits conferred upon humanity by the introduction of anæsthesia by chloroform into the practice of surgery and midwifery. About the same time he received the Knighthood of the Royal Order of St. Olaf from King Oscar of Sweden.

Dr. Simpson was the author of numerous medical treatises that are well known in all quarters of the world, and many of them have been translated into nearly all the European languages. In January, 1866, he was created a baronet, in recognition of his services as the discoverer of the anæsthetic properties of chloroform, and in the same year he received the honorary degree of D. C. L. from the University of Oxford. In September, 1867, he was President of the Department of Health in the Social Science Congress held at Belfast. The lectures of Dr. Simpson did much towards giving the Edinburgh School of Medicine its high reputation, and his fame as a physician secured him the largest practice, perhaps, ever enjoyed by any member of the profession in Scotland. The claims of Dr. Simpson to the honor of being the first discoverer of the anæsthetical properties of chloroform have been disputed, but it is generally considered that he is entitled to it."—*Med. and Surg. Reporter*.

HEINRICH GUSTAV MAGNUS, of the University of Berlin, Prussia, died on the 4th of April, aged 68 years. He occupied the Chair of Natural Philosophy and Technology, and was one of the most prominent among the German Naturalists.—(*Fr. Hoff.*)

WILLIAM NEERGAARD, JR., son of William Neergaard, Pharmaceutist of New York, died in that city on the 27th of April, of heart disease arising from rheumatism, at the age of 21 years. In 1866, after having received a good education, he was placed by his father as an apprentice, in the pharmacy of Prof. Maisch, of Philadelphia, during two years, and attended two courses at our College. An attack of disease caused his return to New York, where he subsequently graduated in Pharmacy in 1869. The deceased was intelligent, studious, quick in perception, clear in judgment, possessed of exemplary habits and promised to become an ornament to his profession.

THE
AMERICAN JOURNAL OF PHARMACY.

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SEPTEMBER, 1870.  
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ON THE MOST DELICATE COLOR TEST FOR THE DETECTION
OF STRYCHNIA.

BY WILLIAM T. WENZELL, of San Francisco, Cal.

Toxicologists seem greatly at variance as to the precise limit of sensibility of the color tests usually applied for the detection of strychnia. Among writers and authorities may be cited those who have designated limits beyond which the identification of the alkaloid is regarded as doubtful; Wm. Copney places the test limit at 1-500,000th, G. T. Wormley 1-100,000th, Dr. De Vry 1-60,000th, Jordan 1-50,000th, all of whom recommend and use the test of bichromate of potassa and sulphuric acid. Wm. A. Guy uses a test liquid of a solution of 10 grs. of permanganate of potassa in one ounce of water, and is used in conjunction with sulphuric acid. He gives a stated limit of 1-12,000. Rodgers and Girtwood use a test which consists of 500 grains of sulphuric acid holding 1 grain of chromic acid in solution, which they esteem particularly useful for the detection of minute quantities of strychnia; but its limit of sensibility has not been stated.

The best form of using and manner of applying the color tests has also been a matter of opinion, but it is now generally believed that the application of the color test in the solid form is that which is to be preferred. The deserved superiority of using it in this form, although it is the best for the detection of quantities not exceeding the 1-100,000th of a grain of strychnia, in greater attenuations it seems incapable of inducing that characteristic development of colors which forms the means of positive

recognition of the alkaloid. The cause seems obvious. The proportions of the salt and acid used are always too great towards the quantity of strychnia tested if it exists in very minute proportions or traces. It is required to add to the acid previously dropped upon the suspected spot a fragment of a crystal of bichromate of potash, but if the alkaloid is minute, however small the crystal may appear, the oxidation will take place so rapidly as to either fail altogether in making an impression upon the optic nerve, or merely produce a momentary flash of blue without any subsequent play of colors, the absence of which cannot be received as sufficient evidence to prove the positive presence of strychnia. In testing for minute portions of the alkaloid it is a desideratum to use a reagent, the proportionate relations and superior sensitiveness of which will admit of the successful demonstration of traces of the poison. In experimenting towards that end I have found that a solution of one grain of permanganate of potassa in 2000 grs. of sulphuric acid is, *par excellence*, the test for that purpose. In delicacy of reaction, brilliancy of colors and duration, I have found it to be, in parallel experiments made with the bichromate of potassa and sulphuric acid test, greatly its superior.

While I do not claim priority of discovery of a valuable reagent in the use of the permanganate,—an honor which duly belongs to Wm. A. Guy, of London, and to whose valuable investigations on alkaloids and their tests I take pleasure in referring,*—I would simply state that I was not cognizant of its use as a test for alkaloids prior to the time when I first tried it; but becoming acquainted with that fact, I henceforth relinquished all claim. Believing it to be a valuable reagent, I determined to test its value. Considering a solution of the permanganate in sulphuric acid proper, and preferable to a solution in water, inasmuch as the water can act only as a diluent, and therefore must prove to some degree detrimental to the sensibility of the test. Further, a solution of the permanganate in water (10 grs. to 31) possesses a deep purple color, which might possibly be-

* On Color Tests of Strychnia and the Diagnosis of the Alkaloids. By William A. Guy, M.D. Cantab., vol. 2 and 3, pp. 558, 602. 11 and 12 Pharm. Journ. and Trans.

come a source of error, while on the other hand a solution of that salt in sulphuric acid (1 gr. to 2000 grs.) exhibits a light green color, which is less liable to be confounded with the colors developed during the application of the test.

The test solution of strychnia was made with the crystallized alkaloid dissolved by the intervention of sulphuric acid in water; each drop of the solution representing the $\frac{1}{50000}$ of a grain of the alkaloid. A pipette was used capable of dropping one-sixth of a drop. The drop here alluded to was carefully ascertained to be equal to 1.2 minim. So that the pipette drop was equal to 0.2 minim. The dilutions were prepared from this normal solution. The following table will exhibit the different strychniated solutions prepared for experiment, with amounts of strychnia contained in each $\frac{1}{6}$ th drop, and the comparative results obtained by the application of the different test agents employed:

Amt. of strychnia contained in $\frac{1}{6}$ drop of each solution.	KO,2CrO ₃ & SO ₄ H test (solid).	CrO ₃ and SO ₄ H test (1—500).	KO,Mn ₂ O ₇ and SO ₄ H test (1—2000).
$\frac{3}{6}$ drop $\frac{6}{3} \times 50,000 = 1-100,000$.	Color reaction distinct and well defined.	Color reaction very fine and distinct.	Reaction very brilliant and durable.
$\frac{1}{6}$ drop $\frac{6}{1} \times 50,000 = 1-300,000$.	Reaction weak and evanescent.	Colors fine and distinct.	Colors brilliant and reaction distinct.
$\frac{1}{6}$ drop $\frac{12}{1} 50,000 = 1-600,000$.	No reaction.	Colors still definable, but weak.	Reaction distinct and colors fine.
$\frac{1}{6}$ drop $\frac{18}{1} 50,000 = 1-900,000$.		No reaction.	Reaction faint, but succession of colors well defined.
$\frac{1}{6}$ drop $\frac{24}{1} 50,000 = 1-1,200,000$.			Reaction very faint.

It will be seen on inspecting the above table that the limit of positive recognition by the bichromate of potassa and sulphuric acid test may be placed at $\frac{1}{1000000}$, that of the chromic acid, &c., test, at $\frac{1}{500000}$, and that of the permanganate at $\frac{1}{900000}$. The manner in which the experiments were conducted may be stated as follows:

The one-sixth of a drop of the normal solution was dropped from the pipette upon a warmed, highly glazed porcelain surface, and allowed to evaporate spontaneously. The thin circular film which the drop left was readily perceived by the aid of a good light. It was found that the alkaloid contained in the

drop tends on evaporation to crystallize principally near the edges of the drop, thus forming the margin, which constitutes the circular outline of the film. It is therefore the margin of the evaporated drop that will furnish the most decided evidence of the presence of the alkaloid. By means of a blunt-pointed glass rod, the point of which having been slightly moistened with sulphuric acid, a small drop was placed upon the margin of the film, and in using the bichromate test, a most minute crystal of that salt was placed upon or pushed into the drop of acid, and by means of a glass rod the crystal, together with the acid, was drawn around the margin of the film. This mode of procedure with this test, although very delicate, will fail to detect the strychnia positively in this fractional drop. By superimposing and evaporating successively three $\frac{1}{6}$ drops, the reaction is then rendered quite positive.

In testing with the liquid reagents the sulphuric acid must be added in extremely minute quantities. A mere dot placed upon the margin of the film must be regarded as sufficient, and its effect upon the deposit carefully observed. Then by means of a small pipette, the point of which is drawn to a capillary bore and charged with the reagent, a minute drop of it is allowed to flow upon the dot of acid, when by means of a pointed glass rod drawn around the margin of the spot, the colors created by the reagent are obtained with various degrees of vividness and duration, according to the amount of alkaloid contained in the deposit, and the permanganate test will positively indicate the 1-900,000th of the alkaloid. I have successfully concentrated a $\frac{1}{6}$ drop by placing the porcelain plate obliquely while the droplet is evaporating; the drop will gradually contract on the glazed surface to about one-third of the space it would have otherwise occupied, and thus serve to insure more positive results. Scrupulous accuracy and cleanliness should be observed in conducting these microchemical manipulations. The reagent ought to be freshly prepared from pure materials, of proper strength, and used quantitatively with the greatest care.

Philadelphia, August 28, 1870.

PHOSPHATE OF LIME IN ACETIC ACID.

To the Editor of the American Journal of Pharmacy:

SIR,—Not long since, I had occasion to determine in a sample of undried Charleston, S. C., guano the amount of phosphoric acid, and being out of chemically pure acetic acid, I requested my assistant to procure for me a small quantity at No. , this city. Although the figures of the first and second determinations corresponded, they were unsatisfactory; those of the third, fourth, and fifth determinations, differing largely among themselves, were equally unsatisfactory. Here follow the percentages: Nos. 1 and 2, 28.69 per cent.; No. 3, 26.75 per cent.; No. 4, 33.42 per cent.; No. 5, 30.22 per cent.

As the method used by me gives, when properly executed, very concordant results, it was thought advisable to test the *chemically pure* (!) acetic acid. Ammonia in excess was added, when a *copious, white, gelatinous precipitate* formed, which, on investigation, proved to be *phosphate of lime*. (The ammonia filtrate I omitted to examine. I doubt not that it contained lime originally combined with carbonic acid.) It is easy now to account for the high percentages of phosphoric acid, and to explain the discrepancies the following is offered:

The hydrochloric or nitric acid solution of the guano (prepared in a proper manner), to which a known quantity of citric acid has been added, is supersaturated with ammonia, the precipitated bone-phosphate of lime dissolved in an excess of acetic acid, and the lime eliminated by means of oxalate of ammonia. Now, according as the excess of ammonia is large or small, the result will be influenced, not only by the amount of acid required to saturate an excess, large or small, but by the excess of acid as well; and, had not the quantity (1 gramme) of substance used for analysis been the same in each case, it would be natural to seek a cause here; for it is evident the smaller the amount of substance taken, the higher the percentage of phosphoric acid, and *vice versa*.

When *pure* acetic acid was used, the sample of Charleston, S. C., guano yielded of phosphoric acid 22.36 per cent.

The writer regrets that he is unable to give the percentage of

phosphoric acid and lime contained in the acid, he having exhausted his stock in the foregoing experiments, and, on procuring some more, *at the same place*, it was *free* from impurity.

In conclusion, it remains to ask, Whence came the phosphate of lime? Supposing that it was intended to convert, *with little trouble*, an *inferior* acid into a *superior* one, would it be assuming too much to say that *bone-black* was the medium?

Respectfully,

WM. H. BRUCKNER, Ph. D.

*Chemical Laboratory, No. 138 Walnut street,
Philadelphia, Aug. 11, 1870.*

NOTE ON ADULTERATED SAFFRON.

BY JOHN M. MAISCH.

Pharmaceutical literature has, on frequent occasions, noticed various adulterations of saffron. The old clumsy method of mixing saffron with the florets of *Carthamus tinctorius*, or with the dyed florets of *Calendula officinalis*, or with the cut petals of various flowers, seems to be discarded now, and new methods, among them some very ingenious ones, are now practiced. It is not very difficult to find excellent saffron in the American market, though inferior kinds, partly exhausted and well oiled, are by no means uncommon.

I have lately received some saffron very handsome in appearance, of good and strong odor, and yielding a deeply colored tincture. Some yellow filaments were intermixed, which proved to be partly the styles, but mainly the stamens with the anthers attached. This last named intermixture naturally led to the conclusion, that the orange red powder which was found distributed through the saffron, consisted of pollen. A number of small lumps were observed, somewhat glutinous to the touch, and consisting of a few styles, some other filamentous substance and the pollen-like powder. To determine the nature of the unrecognized filaments, a few lumps were thrown into water, when they were found to be stamens and anthers. In this experiment, the water had become so slightly tinged, and the supposed pollen settled so readily and in such a peculiar manner, that

suspicion was aroused as to its identity. Under the microscope it did not show the structure of pollen; treated with dilute muriatic acid it dissolved readily, with strong effervescence, and the solution, supersaturated with ammonia, produced with oxalate of ammonia a white precipitate. The powder consisted of prepared chalk, colored by saffron and treated with glucose or honey to improve its pollen-like appearance, the aqueous infusion of the powder giving abundant evidence of the presence of sugar. The proportion of this adulteration is estimated at about 10 per cent. of the entire weight.

A similar adulteration of saffron, which occurred in Germany, is noticed on page 218 of this volume, the adulterant being gypsum, used to the amount of 12 per cent. The employment of chalk for this purpose I consider as quite an *improvement* on the former.

The adulteration was doubtless made in Europe; the saffron was obtained from a first class house, but had passed already through two hands. The saffron being otherwise good, the fraud is very likely to deceive, and a close scrutiny is advisable whenever *pollen* is apparently adhering to saffron.

P. S.—After the above was in type, I received through a friend two samples from the New York market, one of which was pure saffron, but collected with the entire styles, so that it was a mixture of about one part yellow and three parts saffron colored filaments; the other sample consisted of some true saffron, but was mainly composed of the florets of *Carthamus* partly broken up, and the florets of *Calendula* dyed red, and rolled up, to resemble saffron somewhat. It seems, therefore, that what I have above called a clumsy method of adulterating saffron, is still practised,—the product being likely to satisfy the careless, and those who invariably buy *cheap* drugs.

NOTE ON MISTURA CRETÆ.

Editor Am. Journ. of Pharmacy:

Dear Sir:—Allow me to recommend to your readers the following formula for Mistura Cretæ, which yields a preparation that does not ferment in the warmest weather and always gives satisfaction.

R Cretæ Præp.
 Pulv. Gum. Acac.
 Glycerinæ (pure) aa ℥i
 Aquæ Cinnamomi, ℥xv

Mix in the usual manner.

In the revision of our national standard I hope to see glycerin substituted for syrup and sugar in very many officinal preparations, believing it will in almost every instance be an improvement. Glycerin preparations made by cold percolation direct from the crude drugs may advantageously take the place of nearly all the present officinal syrups, possessing, if desired, the same density, better representing their respective bases, and of far more stable character. Of this I am satisfied from actual experiment.

I would respectfully suggest to Mr. Herman Koch an improvement in his method of making suppositories, i. e., to substitute tin-foil for paper in forming the moulds. I have found it much to be preferred. Respectfully,

H. P. REYNOLDS.

Plainfield, N. J., July 8th, 1870.

ADDITIONAL NOTE ON TINCTURE OF NUX VOMICA.

To the Editor :

Dear Sir:—In answer to your question appended to my note on Tinct. Nux Vomica in the last Journal,* I will state that I examined the small amount I had left for potassa and soda and found it to contain neither, using the blow-pipe test, which produced neither a purplish nor yellow color in the outer flame of the pipe; the purplish color would have showed the presence of potassa and the yellow soda. As the above tests sometimes fail in detecting these two alkaloids, I used other tests, and could find neither soda or potassa. I next examined it for ammonia, and the result here proved the presence of that alkali. Tests used were adding carb. soda, and heating; the odor of ammonia produced was quite strong. I next brought the vapor in con-

* See page 229 of July number.

tact with vapors from muriatic acid, and the white cloud-like appearance was formed. The vapor also restored litmus paper to its blue color, after being reddened by nitric acid. This proved at once that the alkalinity of the nux vomica was due to ammonia, and not to strychnia, as I thought. But the crystals formed in the bottle were strychnia with a small amount of brucia, as I have stated before, and no doubt were displaced by the ammonia. Yours respectfully,

GEO. W. KENNEDY.

Pottsville, July 18, 1870.

ON CHALK MIXTURE.

BY W. RANSTEAD JONES.

Editor Amer. Journ. Pharmacy:

Dear Sir,—On several occasions I have found chalk mixture, prepared as directed by the U. S. D., to turn sour, if made for a few days. To avoid this I have pursued the following plan with satisfaction. I prepare a powder of

Prepared Chalk, ℥ss .

P. Sacch. Alb.,

P. G. Acacia, *aa* ʒij .

Mix well by rubbing in a mortar, and keep well stopped from the air in a bottle. Where the chalk mixture is required, take ʒj of the powder to f℥ss each of water and cinnamon water for each f℥ of chalk mixture required.

Mt. Airy, Phila., Aug. 11, 1870.

TINCTURA CINCHONÆ COMPOSITA.

To the Editor:

As the time is fast drawing near when our Pharmacopœia will be revised, I thought it would not be out of place to make a suggestion in reference to the U. S. P. formula for Tinct. Cinch. Comp. The composition of it, as we are all aware, is red cinchona bark, bitter orange peel, Virg. snake root, saffron and red saunders. What I want to call attention to is the red saunders. Why is it used in the preparation for no other purpose than to give the tincture a dark red color? Now we have color-

ing matter enough in the other drugs that are used to make the tincture a dark red color. I do not use any saunders, in making this tincture, and always have a beautiful dark preparation, and prefer it to our officinal formula. I believe the committee on revision would do well to drop it from the tincture altogether, as there are no real medicinal properties in the drug; and where is the use of pouring dye stuffs into the stomach and no benefit to be derived from them? Yours respectfully,

GEO. W. KENNEDY.

Pottsville, Pa., July 21, 1870.

GLEANINGS FROM GERMAN JOURNALS.

BY DR. FREDERICK HOFFMANN, of New York.

Contributions to the Knowledge of the Opium Alkaloids.

O. Hesse, well known by his elaborate researches on the cinchona alkaloids, has published in the *Annal. der Chem. & Pharm.* vol. 153, p. 47, the results of a series of researches on some of the alkaloids of opium, especially on meconidine, laudanine, codamine, thebaïcine and papaverine. The following is a brief résumé of the author's paper:

Meconidine— $C_{20}H_{23}NO_4$ —forms a yellowish-brown, diaphanic, amorphous mass which melts at $58^{\circ}C.$; it is readily soluble in alcohol, ether, chloroform, benzene and acetone; its alcoholic solution blues red litmus paper and neutralizes acids. Being insoluble in water, it has no taste; its acidified solution, however, tastes bitter. Strong sulphuric acid dissolves meconidine with olive-green, strong nitric acid with orange-red color. Meconidine as well as its salts are unstable, and their solutions readily decompose, especially when they contain acids.

Laudanine— $C_{20}H_{25}NO_3$ —crystallizes in small anhydrous colorless prisms; it melts at $165^{\circ}C.$, and on cooling congeals in crystals; it is readily soluble in benzene, chloroform and boiling alcohol, but little in cold alcohol and in not less than 540 parts of ether; its solutions are bitter. With ferric chloride they form a deep green precipitate. Strong nitric acid dissolves laudanine with orange-red color, strong sulphuric acid with rose color; on warming, the latter solution turns dark purple.

Codamine— $C_{19}H_{23}NO_3$ —forms large colorless prisms, readily soluble in boiling water, in alcohol, ether, chloroform and benzene; its solutions blue red litmus paper and neutralize acids, forming salts of a very bitter taste, all of which are apparently amorphous. Codamine melts at $121^\circ C.$, and congeals on cooling. With strong nitric acid it forms a dark green solution, which after a while turns brighter; with strong sulphuric acid it forms a blue solution.

Lanthopine— $C_{23}H_{25}NO_4$ —forms a white tasteless crystalline powder, soluble in chloroform, but very little in alcohol, ether and benzene; with strong nitric acid it forms a dark red resin, which gradually dissolves in the acid; strong sulphuric acid dissolves lanthopine with purple color. Its salts crystallize, and their solutions are liable to deposit precipitates in a gelatinous condition.

Thebaine— $C_{19}H_{21}NO_3$, $C_4H_6O_6 + H_2O$ —crystallizes in beautiful colorless crystals, much like benzoic acid, and also in solid prisms. It melts at $193^\circ C.$, and on cooling recrystallizes. Thebaine is readily soluble in alcohol, benzene and chloroform, but nearly insoluble in cold water; 140 parts ether are required to dissolve 1 part of thebaine; its solutions are tasteless; its alcoholic solution blues red litmus paper, and neutralizes sulphuric acid. Strong nitric and sulphuric acids decompose thebaine, the latter producing a deep pink solution, which, when diluted with water, forms, on addition of ammonia, a white amorphous precipitate, which successively turns blue, green, red and brown; if, however, diluted sulphuric acid had been used for the solution of the alkaloid, the sulphates of thebaine and thebaine are formed without change of color.

Thebenine forms a white, flocky precipitate, little soluble in boiling alcohol and ammonia, insoluble in ether and benzene, but freely soluble in potassium hydrate solution; it neutralizes hydrochloric and sulphuric acids, and forms with the latter a beautiful blue solution, which discolors on dilution with water, but which restores the dark color on further addition of strong sulphuric acid. The chlorhydrate of thebenine is to all appearance no poison, whilst the analogous thebaine is one of the most powerful poisons.

Thebaïcine is readily soluble in potassium hydrate solution, very little in boiling alcohol, and insoluble in ether, benzene, water and ammonia. With strong nitric acid it forms a dark pink solution; with strong sulphuric acid, a dark blue one. The author thinks thebaïcine very likely to be isomeric with thebaïne.

Papaverine— $C_{21}H_{21}NO_4$ —crystallizes in colorless tender prisms; it is readily soluble in warm alcohol, in chloroform, benzene and in acetone, very little in cold alcohol and ether; its solutions do not act upon red litmus paper. Strong sulphuric acid dissolves papaverine colorless; acetic acid dissolves it without being neutralized.

Hesse prepared, examined and analyzed a number of papaverine salts.

At the conclusion of his elaborate paper O. Hesse points out some of the general results of his studies on the opium alkaloids. In order to form a correct idea on the comparative small quantities of these alkaloids in opium he states, for instance, that a Turkey opium which contained 8.3 per cent. morphine, contained only 0.0058 per cent. lanthopine, 0.0052 per cent. laudamine, and 0.0033 per cent. codamine.

Codamine and laudamine belong, with the more important opium alkaloids, to an homologous series, whose members differ successively by the radical $X CH_2$. This series is at present:

Morphine,	.	.	=	$C_{17}H_{19}NO_3$.
Codeïne,	.	.	=	$C_{18}H_{21}NO_3$.
Codamine,	.	.	=	$C_{19}H_{23}NO_3$.
Laudamine,	.	.	=	$C_{20}H_{25}NO_3$.

Collateral members to this series are until at present:

Pseudomorphine,	.	.	=	$C_{17}H_{19}NO_4$.
Apomorphine,	.	.	=	$C_{17}H_{19}NO_2$.

A second series of homologous opium alkaloids are:

Papaverine,	.	.	=	$C_{21}H_{21}NO_4$.
Lanthopine,	.	.	=	$C_{23}H_{25}NO_4$.
Cryptopine,	.	.	=	$C_{23}H_{25}NO_5$.

and probably

Narceïne,	.	.	=	$C_{23}H_{29}NO_9$.
Rhœadine,	.	.	}	$C_{21}H_{21}NO_9$.
Rhœagenine,	.	.		

Rhœagenine, whose salts are analogous to the corresponding salts of papaverine, may accordingly be viewed as dioxypapaverine, and cryptopine as oxylanthopine :

Papaverine, $C_{21}H_{21}NO_4 + O_2 = C_{21}H_{21}NO_6$ Rhœagenine.

Lanthopine, $C_{23}H_{25}NO_4 + O = C_{23}H_{25}NO_5$ Cryptopine.

An intermediate alkaloïd between papaverine and lanthopine has as yet not been found in opium, very likely because in the processes of vegetable life it may readily be transmuted into narcotine— $C_{22}H_{23}NO_7$; the formula of such an alkaloïd ought to be $C_{22}H_{23}NO_4$.

Whether meconidine is closely related to the papaverine series or to papaverine itself is not evident, neither from its formula nor from its deportment; it contains two equiv. H more than papaverine; perhaps both alkaloïds are forms of successive transmutations of the vital processes within the plant.

It may here opportunely be remembered that meconidine is homologous to the alkaloid of another Papaveracea, to sanguinarin— $C_{18}H_{17}NO_4$, which is said to be identical with chelerythrine, the alkaloïd of chelidonium majus.

Contributions to the Knowledge of the Aconitine Alkaloids.—Flückiger, in a paper on the alkaloids of the aconite tubers, arrived at the following conclusions :

1. Aconitine is contained in the European aconites with blue flowers, especially in *Aconitum Napellus*, L.; it is also contained in similar species of the *Himalaya*, which are known under the name of Bikh, and among which is also *Aconitum Napellus*. *Aconitum Lycoctonum*, L. (with yellow flowers), according to Hübschmann's researches, is void of aconitine.

2. Aconitine has the following properties: It softens in boiling water, and colors concentrated hot phosphoric acid purple, which color is retained, when cool, for several days. The watery solution of aconitine tastes bitter, not acrid; it is not precipitated by platinic chloride solution, but gives a voluminous amorphous precipitate with potassium iodo-hydrargyrate. Aconitine dissolves readily in ether, alcohol and chloroform; it is anhydrous, melts near 120° C., not at 80° C.; it forms a monochlor-

hydrate. The aconitine nitrate crystallizes in well-defined crystals; the alkaloid forms only exceedingly small and indistinct crystalline masses.

3. All samples of aconitine from England which the author examined corresponded in their above deportment with German aconitine, except one sample from Hopkin & Williams, which beside being bitter was very acrid; therefore Dr. Flückiger thinks that English and German aconitine at present are identical.*

4. There is an alkaloid entirely different from aconitine, and of uncertain derivation, perhaps from aconite tubers (Bikh) from Nepal and the slopes of the Himalaya. Flückiger terms this alkaloid pseudaconitine; Schroff called it English or Morson's aconitine; Wiggers proposed the name Napellin; Flückiger called it previously Nepalín; Ludwig, acrakonitine.

Pseudaconitine does not soften in boiling water, tastes acrid, not bitter, and does not color concentrated hot phosphoric acid; it is insoluble in water, little in alcohol, ether and chloroform, but crystallizes from its hot saturated solution in large prisms.—*Pharmac. Centralhalle*, 1870, 24.

Iodoform as a Means to Detect Alcohol.—A. Lieben, in the *Annal. der Chem. & Pharm.* 1870, Suppl. Bd. vii, 2, describes a method of detecting ethyl alcohol by the formation of iodoform. In the simple case when the presence of alcohol in a watery solution has to be determined, the sample is warmed in a test tube, a few drops of an iodinated potassium iodide solution are added, and afterwards a few drops of potassium hydrate solution. If the quantity of alcohol is not too small, a turbidity results by the formation of microscopically small yellow crystals of iodoform.

Hager finds this reaction very accurate, and states that it detects alcohol in liquids containing but 1-2000th after about one day's standing. The crystals are remarkable and beautiful by the variety of their star-shaped arrangement. Hager suggests the following *modus operandi*: The reagents used are a solution

* The variations of commercial aconitine, as stated by Merk's and Hübschmann's researches, are given in my Report on Progress of Pharmacy to the Amer. Pharm. Assoc. in the Proceedings of 1869, p. 263.

of potassium iodide in 5—6 times its weight distilled water and oversaturated with free iodine and a solution of potassium hydrate of about 10 per cent. strength. To the liquid to be examined 5—6 drops of the latter solution are added. After warming to about 50° C. so much of the potassium iodide solution is added drop by drop that its color, after gentle agitation, remains yellowish-brown; then the liquid is carefully discolored by the addition of a few drops of the potassium hydrate solution. When set aside the iodoform crystals deposit, and are recognized under the microscope.

The process is obvious; it is effected not alone by ethyl alcohol, but by a number of different substances, among which are aldehyde, acetone, gummi, sugar, lactic acid, methyl alcohol, propyl alcohol, and many volatile oils. The formation of iodoform is *not* produced by amyl alcohol, ether, ethyl chloride, chloroform, chloral hydrate, glycerin, phenol, and by acetic, benzoic, butyric, citric, formic, oxalic, succinic, valerianic and tartaric acids.

Detection of Alcohol in Chloroform and Chloral Hydrate.

This test is, according to Hager, superior to any for the detection of alcohol in chloroform and chloral hydrate:

Chloroform.—To determine the presence of alcohol in chloroform 2 vol. chloroform are mixed with 5 to 10 vols. of water, of about 50° C. The liquid, after some shaking, is poured on a filter previously completely saturated with water. The filtrate is then examined as described above. After 12—24 hours depositing the sediment is examined under the microscope.

Chloral Hydrate.—Chloral forms with ethyl alcohol chloral alcoholate, corresponding to chloral hydrate in its chemical and physiological properties. Since the equivalent weight of ethyl alcohol is five times greater than that of water, it is of considerable pecuniary advantage to the manufacturer to bring the chloral alcoholate into the market instead of the hydrate; besides the former crystallizes finer and more solid.

The examination is made with a solution of the sample in distilled water, in the above given mode. When discoloring the iodinated liquid, each drop of the potassium hydrate solution

produces turbidity, which, however, disappears on gentle agitation. If the sample contains alcoholate, the liquid remains more or less turbid, or deposits iodoform crystals after a time, although this is partly soluble in the presence of chloral. Of some commercial samples examined by Hager, Schering's chloral hydrate was the only one entirely free from alcoholate.—*Pharm. Centr. H.* 1870, No. 18.

More recently Schering calls attention to some more distinctions between chloral hydrate and chloral coholate; when warmed in a test tube in twice their bulk of water, the hydrate, as known, dissolves readily, but the alcoholate melts without solution, and, on cooling, congeals under the water. Sulphuric acid, when warmed with chloral hydrate, remains colorless, whilst it turns brown with the alcoholate. When warmed in nitric acid of 1·2 spec. gr., chloral hydrate gives none or but a very slight reaction, whilst with the alcoholate a vehement reaction ensues under evolution of nitrous oxid gas.—*Pharm. Centr. H.*, 1870, No. 26.

Examination of Commercial Sulphuric and Hydrochloric Acids for Arsenic.

Sulphuric Acid.—In a test tube, of medium size, about 5 grains of stannous chloride are dissolved in 4—6 c. c. pure hydrochloric acid, of about 25 per cent. strength. To this solution 2—3 c. c. of the sample of the sulphuric acid are added, drop by drop, and with frequent gentle agitation; the mixture evolves considerable heat. If a white precipitate be formed, a few drops hydrochloric acid are added in order to dissolve it. When the sample is free from arsenic, the liquid remains clear for quite a time; but if arsenic is present it becomes yellow, and turns gradually dark brown and turbid, and after some hours grayish-brown arsenic deposits in flocks.

Hydrochloric Acid.—The mode of examination is the same, but instead of the pure hydrochloric acid the sample to be examined is used, and instead of the sulphuric acid the monohydrate of pure sulphuric acid.—*Pharm. Cent. H.* 1870.

Suggestion to Preserve Medicines liable to Deterioration.—Aqueous tincture of rhubarb is a popular remedy with German

physicians. It is prepared, according to the Prussian pharmacopœia, by maceration of 12 parts rhubarb in slices, 3 parts carbonate of potassa and 16 parts of spirituous cinnamon water. After 12 hours the pulp is expressed and the liquid filtered. This preparation is very liable to deterioration, and its preservation has been a constant subject of suggestions. Recently C. Baumann applied to its preservation a method which in this case was very successful, and which perhaps merits consideration. Baumann evaporated the tincture to a syrupy consistency, and absorbed this by a weighed quantity of previously washed, levigated and dried quartz sand, and exsiccated the whole at a gentle heat. By weighing the dry mass, the proper proportion and the quantity corresponding to each ounce of the tincture may easily be ascertained. 800 parts tincture and 310 parts sand give 400 parts dry residue. From this the tincture can readily be extracted by stirring the required weight with the corresponding quantity of water, and by decantation or filtration if necessary.—*Pharm. Cent. H.* 1870, No. 19.

GLEANINGS FROM GERMAN JOURNALS.

BY JOHN M. MAISCH.

Cinchona barks from Java.—Of the first 9 bales of cinchona barks received a few months ago from Java, by the Dutch government, Julius Jobst has received four samples, which had been assayed by Prof. Gunning, of Amsterdam, and subsequently by Jobst, with the following results. The marks are those of the Dutch “maatschappy”:

No. I. T. P. Java Royal Cinchona.—Alkaloids: 3·5 per cent. soluble in ether (much quinidia), 2·0 per cent. insoluble in ether. G.—3·2 per cent. alkaloids: much quinidia and cinchonina, trace of quinia, no cinchonidia;* an amorphous base, the examination of which is promised. J.

Nos. II & III. T. P. Java Royal Cinchona.—Alkaloids: 2·1 per cent. soluble (with little quinidia), 1·3 per cent. insoluble in ether. G.—3·5 per cent. alkaloids, with 1·7 quinia = 2·3 sul-

* Conchinin of Jobst's paper = quinidia, and chinidin = cinchonidia of Pasteur.—J. M. M.

phate, little cinchonidia, quinidia, cinchonia and amorphous base. J.

No. IV. M. Java Royal Cinchona.—Alkaloids 1·5 per cent. soluble (with little quinidia), 1·0 per cent. insoluble in ether. G.—1·9 per cent. alkaloids with 0·5 per cent. quinia = 0·7 sulphate, cinchonia, some cinchonidia, quinidia and amorphous base. J.

T. P. Brown Java Cinchona.—Alkaloids: 1·1 per cent. soluble, 0·9 per cent. insoluble in ether. G.—1·2 per cent. alkaloids, mostly cinchonidia and amorphous base, trace of quinia; neither cinchonia nor quinidia. J.

The latter is undoubtedly Pahudiana bark. The propagation of the plants yielding it has been prohibited by the Dutch government. Nos. II & III approximate bad Calisaya bark, as at present frequently met with. The present Java cinchona barks are not yet adapted to the manufacture of quinia, though they may be used in place of the grey and brown Huanuco and Loxa barks, which at present are rather scarce. The price of the Java cinchonas is 3 guilders (\$1.20 gold), per kilo.—*Buchner's N. Repert.* 1870, 341–345.

Behavior of ferroso-ferric oxide to saline solutions.—Dr. J. B. Schober observed that this oxide has the property of absorbing certain salts from their dilute aqueous solutions, and fixing them in such a way that they cannot be removed by washing. This is the case with the nitrates of lead, silver, copper and nickel, the sulphates of copper, iron and zinc, stannic chloride, &c., also organic matter. Alum, chromic alum and tartar emetic are decomposed, the salt of the alkali remaining in solution. Baryta salts are with difficulty absorbed, still more difficult the lime and strontia salts. Corrosive sublimate, magnesia and alkali salts are not absorbed. Oxide of iron appears to have similar properties, but in a less degree.—*Ibid.* 345–348.

Tin foil containing lead to the amount of from 1 to 19 per ct. is often met with. Aug. Vogel found that soap, chocolate and dry candies wrapped into such foil for some time, are not contaminated with lead, but cheese, under similar circumstances, always contained lead in and near the rind, in small proportion.—*Ibid.* 348–351.

Rhinanthin.—Prof. H. Ludwig has had occasion to examine some rye bread, of a violet black color, also the grain from which the flour had been made. The latter contained 97·5 per ct. of the fruit of cereals, nearly all rye, the balance being seeds of weeds, &c., among them 1·415 parts from *Rhinanthus alectorolophus*, Lin. (*Alect. hirsutus*, Reichenbach), to the presence of which the color of the bread was due, and from which the chromogen was obtained. The crushed seeds were exhausted with boiling alcohol, the solvent evaporated, the oil removed by ether, and the filtered aqueous solution evaporated to a syrupy consistence, from which rhinanthin crystallizes in stellate prisms, which are to be purified by recrystallization from alcohol. Its aqueous solution is not affected by chlorine, salts of iron, lead, copper and silver (in the cold), but is colored brown by mineral acids. Its alcoholic solution heated with muriatic acid yields a green blue coloration of such intensity that the liquid is nearly black in appearance. It has a bitterish sweet taste and is soluble in water and alcohol. Its composition is $C_{58}H_{52}O_{40}$. Boiled with dilute muriatic acid, it yielded 13·9, and in another experiment 26·7 per cent. of dark brown floccules, rhinanthogenin; composition, $C_{34}H_{20}O_8$. The filtrate contained a fermentable sugar, of the composition $C_{12}H_{18}O_{18}$. The relation of the brown product to the intensely blue body, obtained by alcohol and muriatic or sulphuric acid, was not established.—*Archiv d. Pharm.* 1870, June, 199–215.

The tannin of the European alder, Alnus glutinosa, has been examined by F. Dreykorn and E. Reichardt, who found that with sulphuric acid it splits into alnic red and sugar; fused with hydrate of potassa, phloroglycin, protocatechuic and acetic acids are formed; on dry distillation, pyrocatechin is obtained.—*Ibid.* 215–232.

Preparation of tannin.—Oscar Rothe proposes the following process, which he has found well adapted to Chinese galls: 8 parts powdered galls are macerated with 12 p. ether and 3 p. strong alcohol for two days, the liquid decanted, the residue treated with the same solvents and expressed. The liquid is decanted from the sediment, mixed with 12 p. water, the alcohol and ether recovered by distillation, the aqueous solution rapidly

filtered and quickly evaporated in a steambath, the residue dried and powdered.—*Ibid.*, 232, 233.

Paricina was discovered by Winkler in 1845. Weidenbusch's analysis gave results nearly agreeing with the composition of aricina, which induced Gerhardt to regard it as amorphous aricina. Winkler observed (1865) that, like bebirina, its solutions are precipitated by nitric acid, and that the two otherwise agree in their chemical behavior. Flückiger (1869) assumes the identity of the two (with buxina or pelosina) and suggests that paricina might be obtained from all cinchona barks, being probably contained in the precipitate occasioned by iodide of potassium. O. Hesse has during the last eight years often attempted to obtain paricina from the mother-liquors of quinia, by mixing them with concentrated nitric acid, but always without success. He also directs attention to the statement of Flückiger that pelosina turns polarized light to the right, while paricina is without effect upon it (De Vry), and argues that paricina must still be regarded as a distinct cinchona alkaloid.—*Ibid.* 235–237, from *Ber. d. Deutschen Chem. Gesellsch. zu Berlin*, 1870, May, 232.

Yield of extracts.—E. Schwabe has obtained the following amount of extract from best Smyrna opium: 44.44, 37.50, 54.15 per ct. From socotrine aloes the author obtained by the process of the Prussian pharmacopœia (cold water) 31.25 and 12.5 per ct. extract, from hepatic aloes 48 per ct., and from Cape aloes 16.6 per ct.—*Ibid.* 241, 242.

Balsam of Peru.—E. Schwabe states that when 1 grm. pure balsam of Peru is triturated in a mortar with 5 drops concentrated sulphuric acid, cinnamein is converted into resin, and the balsam assumes the consistence of a pilular mass, of a grey brown color. Adulterations with castor oil or copaiva balsam are shown by the soft consistence of this mass.—*Ibid.*, 242, 243.

Conia in hemlock fruit.—Prof. V. Schroff arrives at the following conclusions from his experiments: 1. The unripe fruit of *Conium maculatum* of the first year's growth contains the least quantity of conia. 2. The largest proportion is found in the well developed unripe fruit of plants of the second year's growth, just previous to ripening. 3. The ripe fruits, occurring only on the second year's plants, are intermediate in the amount

of conia between the unripe fruits from first and second years' plants.—*Ibid.* 261, from *Wien. arztl. Wochenbl.* 1870, 1.

PURIFICATION OF CHLORAL HYDRATE.

BY DR. F. A. FLÜCKIGER.

The author refers to Rieckher's and Hager's observations,* regarding reliable tests for the purity of this medicinal agent, but he objects to its employment unless it be in well formed separate crystals. Though as met with in commerce it is usually of good quality, the crystalline masses or imperfect fractions of crystals are unsightly in appearance and frequently possess a stinging odor, and readily absorb moisture; qualities which are due to its insufficient purification on a large scale. The last traces of impurity cannot be removed by fusing and redistilling it, and its appearance is not improved by this operation. This purpose is effected solely by recrystallization.

There is perhaps scarcely a liquid in which chloral hydrate is insoluble at ordinary temperature; four parts of it dissolve gradually in one part of water, the solution crystallizes at 0° C., but not in well formed crystals. Alcohol and ether dissolve it to such an extent that it likewise does not crystallize well on evaporating these solvents; absolute alcohol must be excluded because it combines with chloral.†

Chloroform and benzole are well adapted for recrystallization, but the first is too dear and the last cannot be entirely removed from the crystals. The same holds good for oil of turpentine, from which most beautiful tables and laminæ are obtained, if 1 p. chloral hydrate is dissolved in from five to six parts of the oil at from 30 to 40° C., and the solution allowed to cool slowly. Fat oils, which dissolve it readily, are evidently not adapted for this purpose. From petroleum ether, which at a moderate heat dissolves much chloral hydrate, it crystallizes well on cooling, but too rapidly to admit of large prisms being obtained; on a large scale, however, it may be of better service.

Uniformly satisfactory results were obtained with bisulphide of carbon. 45 parts of it dissolve at 15 to 18° C. but 1 p. chloral hydrate; it precipitates ethereal and alcoholic solutions of the

* Amer. Jour. Pharm., 1870, p. 238. † L. c. p., 239.

latter. But at temperatures below the boiling of bisulphide of carbon, 4 to 5 p. of it are sufficient for dissolving 1 p. chloral hydrate. If allowed to cool slowly, beautiful crystals often an inch in length are obtained, easily collected, and readily freed from the last traces of the solvent by exposing them in thin layers to the air. Thus obtained, chloral hydrate possesses no acid reaction and does not attract moisture. The best prisms begin to fuse at 49° C., larger quantities at 53 to 54° C., the fused mass congealing again at 34° , or at 40° C. if a few crystals had remained unfused. Samples not well crystallized fuse at a lower temperature. The boiling point is 97.5° C. if the entire thermometer is surrounded by the vapors.

Bisulphide of carbon is cheap. Some loss is unavoidable; impurities in the mother-liquor increase gradually to such an extent that a rectification of the bisulphide over corrosive sublimate becomes necessary. With the last portions of the solvent a little chloral hydrate evaporates from the crystals, but the loss from that source is insignificant, $\frac{1}{2}$ grm. having lost but 3.3 per cent. in nine days. A draft of cold air, the addition of some petroleum ether, and the employment of the centrifugal machine will be of service when operating on a large scale. The price of chloral hydrate ought not to be raised in consequence of such purification.—*N. Jahrb. f. Pharm.*, 1870, April, 200—204.

J. M. M.

ON BENZOIN AND BENZOIC ACID.

BY JULIUS LOEWE.

To determine whether benzoic acid exists free in benzoïn, or whether it is generated by heating the resin, the author sought to answer the following four queries: 1. Does benzoic acid exist ready formed in benzoïn? 2. Is benzoic acid in the resin united with a base? 3. Is benzoic acid formed through the influence of the air upon the fused resin? 4. Is benzoic acid a product of decomposition of a body contained in the resin?

A larger quantity of benzoïn was intimately mixed. Three portions of it, each weighing 15 grm., were heated in the usual manner, in a dish covered with paper, one in contact with the air, one in a current of hydrogen and the third in carbonic acid;

2.2, 2.5 and 2.4 grm. benzoic acid were obtained ; therefore, an oxidation of the resin to benzoic acid does not take place on fusion in atmospheric air.

30 grm. of benzoin were dissolved in 95 per cent. of alcohol and the filtered solution mixed with an alcoholic solution of caustic soda. A red brown sediment had occurred after 48 hours, which was well washed upon a filter with alcohol, dissolved in water and decomposed by boiling with muriatic acid ; an amorphous precipitate separated, which, after filtering, yielded benzoic acid on being heated. If free benzoic acid had been contained in the resin, it would have entered the soda precipitate and been separated in crystals by the muriatic acid ; since, however, it is obtained from the amorphous precipitate only by heat, the author concludes that benzoic acid as such was not present.

The filtrate from the soda precipitate was distilled ; the amorphous residue dissolved in water, yielded with muriatic acid, a resinous precipitate, giving a copious sublimate of benzoic acid, while the acid filtrate on concentration yielded only small quantities of crystalline benzoic acid. The author concludes from this experiment that at least a portion of benzoic acid does not exist ready formed in the resin.

A portion of benzoin was dissolved in alcohol, the solution at the boiling point, precipitated with water, the alcohol distilled off, and the aqueous solution decanted from the sediment ; this was treated four times in the same manner, at last the alcohol was not distilled off, but was removed with the water. The resin thus purified, behaves towards soda and muriatic acid essentially like the crude benzoin. The aqueous, faintly alcoholic solutions did not yield crystals of benzoic acid on evaporation ; a small quantity of it, however was present, its crystallization being prevented by the presence of a resinous body.

These results led the author to the conclusion that some free benzoic acid is present in the resin, but that the greater portion is generated on heating, from one of the proximate principles contained in benzoin.

Of all the different apparatus recommended for the sublimation of benzoic acid, the author prefers that of Mohr, but recommends a steady temperature of 170° C. A flat vessel of iron or copper is connected with a glass tube bent upwards, into

which a thermometer is inserted, while the vessel is covered with paper. The purest acid was obtained by mixing the resin with an equal weight of crude oil of vitriol free from nitric acid; this mixture, put into a leaden vessel, is placed into the iron or copper vessel and then slowly heated to the above temperature to prevent its foaming over.—*Zeitschr. f. Chemie* 1870, part 9, 278. J. M. M.

ON THE FIXED OIL OF ALMONDS.

BY DR. H. HAGER.

There is a considerable difference between the fixed oil expressed from the large sweet and from the smaller bitter almonds, which is readily shown by the elaidin test: the former oil congeals more rapidly and almost completely; while the latter congeals about twelve hours later and the more imperfectly, the smaller the bitter almond has been. The column of elaidin in the test tube obtained from the oil of the sweet and large sized bitter almonds is whitish or yellowish, of the smaller bitter almonds more yellow or brownish and surrounded by one or two thin liquid layers, proving that this oil approaches the drying oils. Only about one-third of its bulk congeals if the oil is from the small Oporto almond.

For medicinal purposes this difference between the almond oils is probably immaterial, since no distinction has heretofore been made between them. But for the last twenty years an almond oil is in the market which yields yellow or brown elaidin, surrounded by thickish liquid layers, and which, in Hamburg and other places, is prepared in large quantities from peach seeds, but sold as *Ol. amygd. optimum* or *verum*.

The author recommends the following test to distinguish true almond oil from the oil of peach and apricot seeds: equal volumes of the oil and 25 per cent. nitric acid are shaken together in a test tube; an emulsion like mixture is obtained, which separates again on standing. All true almond oils yield a purely white mixture, and after many hours the separated oil is still white. On heating the mixture to 60° C. almond oil remains white or becomes faintly yellowish white.

The oils of peach and apricot seeds shaken with the nitric

acid at once turn yellowish, the coloration increases and is in half an hour rather deep red yellow. Mixtures of almond and peach seed oil may be at first white, but after one-half to one hour will be more or less reddish yellow.

Many other oils, for instance ground nut oil (*Arachis*) behave to nitric acid like almond oil. Such an adulteration is readily discovered by sulphuric acid. Upon a porcelain slab 8 or 10 drops of the oil are stirred together with 5 or 6 drops of strong sulphuric acid. Almond oil is colored yellow and retains that color for some minutes; other oils, though often yellow at first, quickly turn green, greenish brown or brown.—*Pharm. Central halle*, 1870, 217, 218.

J. M. M.

DECOMPOSITION OF CHLOROFORM.

By E. C. A. BILTZ, of Erfurt.

The assertion of Dr. Hager (this Journal, page 319,) that chloroform prepared from pure chloral hydrate is not decomposed by light and air, is not correct. This so-called normal *chloroform is decomposed as readily as any other if it be absolutely free from alcohol.*

From $\frac{1}{2}$ kilogramme of pure chloral hydrate I obtained 296 grm. chloroform, sp. gr. 1.498 at 15° C. (the theoretical yield is 306 grm., sp. gr. 1.502); it was very pure, entirely indifferent to sulphuric acid, but still contained some alcohol, to remove which it had to be washed six times with water. It was then dehydrated and rectified, when it had the sp. gr. 1.5019 at 15° C., a boiling point of 62.27° C., and was entirely indifferent to iodide of potassium. Exposed in a half filled white vial to the daylight, it showed, after ten hours, a reddish tinge with solution of iodide of potassium.* On the evening of the second day strong decomposition of this solution, and so on as previously described by me.†

This proves that chloroform prepared from chloral hydrate is prone to decomposition. How the stability of Hager's chloroform agrees with its sp. gr. and boiling point I am unable to say; however, he might have satisfied himself by comparative experi-

* 1 absolutely neutral iodide in 20 water, freshly prepared.

† See Archiv der Pharmacie, 1868, June, 209.

ments, that his tests for alcohol, in this case, are partly entirely useless, partly very difficult. Lieben's excellent test (iodoform) is the only one which, with the aid of the microscope, approaches mine* in delicacy; all others indicate at best $\frac{1}{2}$ per cent., while in our case $\frac{1}{8}$ per cent. and even less is of importance. I do not doubt, therefore, that Hager's chloroform still contains such traces of alcohol, and that it will yet decompose in the course of time.

I would again refer to my former paper on this subject, particularly to the proof that the officinal chloroform does *not* contain sufficient alcohol to prevent its decomposition. The final sentence in Hager's paper (p. 319 of this Journal) must, therefore, be rejected. As long as the officinal chloroform does not contain at least 2 to 3 per cent. of alcohol it must be kept and dispensed in black bottles, to guard against gradual decomposition in the light. And this is not altered in the least by preparing the chloroform from chloral. *Erfurt, May 25, 1870.*
—*Pharm. Zeitung.*, 1870, N. 45, p. 276. J. M. M.

ON GLUCOSE.

BY PROF. CHARLES A. JOY.

In the year 1811, Kirchhoff, a celebrated German chemist, discovered that it was possible to convert starch, by means of sulphuric acid, into sugar. Great expectations were founded upon the announcement of the discovery, as, in consequence of Continental wars and the English blockade, sugar had become a very dear article, and it was at first thought that an ample supply could be obtained in this way; but everybody was destined to be grievously disappointed as soon as the subject was more thoroughly investigated, and it was found that the sugar thus produced was of a different character from that to be obtained from the cane and beet. Still, the discovery of Kirchhoff was of great importance and has led to many practical applications. It was soon found that glucose or grape sugar could be made in

* 1 p. bichromate of potassa in 2000 water, mixed with one-eighth of its volume sulphuric acid. One volume of chloroform is well agitated with half a vol. of this mixture and set aside over night; disappearance of the yellow color proves the presence of alcohol.

several ways, and that it was always the product of the germination of starch grains, and sometimes occurred already formed in nature.

It is probable that both cane and grape sugar are formed from the starch contained in the cellular tissues of the plant, cane sugar being formed first, and then grape sugar, if acids be present. Acidulous fruits contain only grape sugar, whereas cane sugar occurs in those that are free from stronger acids. The chief natural sources of the grape sugar are in the sap of the grapevine, in plums, cherries, figs, honey, in the liver and in diabetic urine ; but it would not be economical to prepare it from any of these sources.

One of the latest methods for the preparation of grape sugar is the one proposed by Maubré, and is as follows : The mixture of dilute sulphuric acid and starch meal is boiled under pressure of six atmospheres. The necessary boilers are similar to those used for high pressure engines, and are lined with lead and provided in the interior with a perforated lead tube for the passage of steam. The boiler is further furnished with safety valve, stop cocks; thermometers, &c. In the process of manufacture 56 pounds of sulphuric acid of 66° B. are diluted with 5,600 pounds water, and heated to 212° F. A mixture of the same amount of acid and water is made in a separate wooden vessel, the heat of which is raised to 86° F. Into the second mixture 2,240 pounds of starch meal are well stirred and heated to 100° F. This is gradually added to the first mixture, and after heating with open valves for a few minutes to 212° F., the stop cocks are all closed and the heat raised to 320° F. and continued until all of the starch is converted into sugar, which requires from two to four hours.

The contents of the boiler are then run into a wooden tank and 168 pounds of pure chalk or carbonate of lime, previously stirred up with 500 pounds of water, is gradually added to neutralize the acid ; the gypsum is caught on a filter and the filtrate evaporated to 20° B., and afterward clarified by blood and bone black and again filtered. In this way the product is obtained pure and free from bitter and empyreumatic taste, and is well suited for any of the purposes to which grape sugar is adapted.

Another way is to convert the starch into sugar by means of

malt. For this purpose 10 to 12 pounds of barley malt are well stirred with 400 pounds of water, and to this are added 100 pounds of starch, and the whole is heated to 158° F., and kept at that temperature for several hours, under constant agitation. At 158° F. the starch becomes pasty, the grains burst, and at first there are no signs of sugar, but in a quarter of an hour the liquid becomes more fluid and begins to have a sweetish taste. Great care must be observed to retain the heat at the same temperature, not to have it either higher or lower than above indicated, and to insure this several thermometers ought to be put in different parts of the apparatus. After six hours the liquor can be filtered and clarified, and evaporated to a syrup. The sugar prepared in this way always retains the taste of malt and is only adapted to use in breweries, where this property will not prove deleterious.

Grape sugar, or glucose, can be prepared in open vessels by allowing a mixture of starch and water to flow gradually at a temperature of 130° F. into a vat containing water acidulated with one per cent. of sulphuric acid. By keeping it at a boiling point the starch is at once altered, without producing mucilage. The amount of starch taken is usually about one-half the weight of water employed. After all of the starch is added, boil for half an hour and decant. The sulphuric acid is neutralized by carbonate of lime as before and the liquid evaporated to the specific gravity of 1.28, and set aside to crystallize. The molasses is allowed to drain off, and the sugar is dried at a gentle heat in a current of dry air.

In the United States, especially in the West, it is more economical to make grape sugar from corn. There are several large establishments where this business is now extensively prosecuted. The corn is steeped in weak soda lye to separate the husk and soften the gluten. It is then ground wet and run through revolving sieves, by which the husks and gluten are separated. The starch flows through long ways and troughs, in which are slats against which the solid particles lodge, and thus separate from the water. The wash water is run into a large cistern, where it can be fermented into weak vinegar. The starch is put wet into a mash tub and treated with one per cent. sulphuric acid in sufficient water for three to eight hours. Where

it is intended to make sugar the whole of the starch is converted, but if syrup is sought then some part of dextrine is left unaltered. The acid liquor is neutralized with chalk as before, and evaporated in vacuum pans, and after the separation of the gypsum is run into barrels and allowed to crystallize. For syrup a certain percentage of dextrine is left in the liquid unconverted, which helps to keep it from crystallizing, and in the manufacture of syrup special care must be observed to neutralize all of the acids. The sugar is sometimes cast into blocks six inches square and dried on plaster plates, in a current of dry air, as hot air would be apt to discolor it. It has been found that glucose can be made from cellulose as well as from starch, but the process is too expensive for practice; it is, however, interesting from a scientific point of view, and ought to be mentioned in this connection.

Two parts of clean linen shreds are gradually added to three parts of sulphuric acid, and they are allowed to stand twenty-four hours; the whole is then largely diluted, and the sulphuric acid neutralized by carbonate of lime or carbonate of baryta. In a similar manner any other kind of cellular tissue, as cotton, wood shavings, paper, etc., can be converted into grape sugar.

It is a singular fact that, although we can prepare grape sugar from cane by the action of acids, no way is at present known by which glucose can be re-converted into sucrose. It would be a discovery of great importance if we could make cane sugar from glucose, as in that event common sugar could be prepared from a great variety of refuse matters, and would be largely reduced in price.

There was a time when much grape sugar was manufactured in England clandestinely, for the purpose of adulterating Muscovado sugar, but this illegitimate business was destroyed as soon as the tariff on sugar was reduced. The price of cane sugar must be very high before manufacturers can afford to make grape sugar for its adulteration.

The starch of potatoes can be converted into glucose by digesting for a few hours with parings of the potato. This operation is largely practised by German farmers in the preparation of food for fattening hogs. The starch is rendered more digestible in this way, and from the glucose some of the larger

proprietors manufacture alcohol, for which they obtain a high price.

An excellent article of starch sugar can be prepared from Indian corn, which will yield alcohol one-eighth cheaper and quite as pure as that from cane sugar. As, by a recent decision of our courts, the manufacturers of alcohol and vinegar from this source are not distillers within the meaning of the tax levy, the business is not hampered by licenses, inspections, or stamp duties, and has thus a great advantage over ordinary distilleries.

In some parts of Europe large quantities of grape sugar are used to add to wine, but in this country it is not so much the wine growers as the brewers who make such an extensive use of it as to give rise to its regular importation. This can hardly be justified excepting in times when the price of barley is very high.

We find in the *Zymotechnic News* of St. Louis, an interesting article on the uses of starch sugar in the manufacture of beer, from which we quote the following paragraphs:

"Barley contains on an average 57 per cent. of starch and cognate substances. These pass into the wort, partly as sugar, partly in the shape of dextrine (gum). The relative proportions of these ingredients vary in accordance with the method of brewing, but experience teaches that, on an average, one bushel of barley yields about 12 pounds of sugar and 15 pounds of dextrine. A portion of the latter substance is further transformed into sugar during fermentation, so that a bushel of barley represents, on an average, 16 pounds of sugar and 11 pounds of dextrine (gum).

"Both dextrine (gum) and sugar are equally essential to the brewing process. The latter furnishes the alcohol, without which no beverage can be called spirituous; while the former constitutes almost the entire extractive matter, or body of the beer, which is one of the chief distinguishing features between beer and wine. Now it is true that all (commercial) starch sugar contains a certain amount of dextrine—the more, the poorer the quality; but this portion would be insufficient in case a good article was used, while in the contrary case it would be paid for at an extravagant rate.

"Imported potato sugar of good quality, containing some 15 per cent. of dextrine (gum), costs about 12 cents per pound at New York. Maize sugar of equal purity can be furnished at 8 cents per pound. Twenty pounds of either article, costing respectively, \$2 40 and \$1 60, would yield 16 pounds of fermentable sugar and 3 pounds of dextrine (gum) while a bushel of barley will not only yield 16 pounds of sugar, but 11 pounds of dextrine or gum besides. Thus starch sugar can be added to beer wort only in small quantities, unless when it is desired to impart a

vinous character to the beer. When the latter object is not in view the best substitute for barley will always be found in maize or some other cheap grain.

“Not so in the manufacture of wine. For this purpose, good starch sugar, containing not exceeding 15 per cent. of dextrine, is decidedly preferable to cane sugar. A pound of the latter of the quality suitable for wine manufacture, costs at least 15 cent; whereas, as just stated, good starch sugar from maize can be sold at 8 cents. Now as 5 lbs. of starch sugar are equivalent to 4 lbs. of cane sugar as regards their yield of alcohol, the balance is altogether in favor of maize sugar, to wit:

4 lbs. cane sugar at 15 cents 60 cents.

5 lbs. grape sugar at 8 cents 40 cents.

“The 15 per cent. of dextrine (gum) contained in the maize sugar will (according to the usual proportion of sugar added to must) increase the amount of ‘extract’ in wine only by a few per cent., and will tend to give it the ‘mouthly’ taste (body) which in meager wines, already fermented, is sought to be produced by the addition of glycerine.

“Enormous quantities of cane sugar are already being consumed in the wine manufacture in this country; so that even as a consideration of national economy it is highly important to supply in maize sugar a partial substitute for imported cane sugar.”

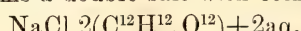
In France there is a use for grape sugar arising from the fact that the sugar manufacturers do not prepare molasses ready for the market as they do in this country. The crude molasses is bought up by second parties and the grape sugar is used very largely by them to extend it and give it body. An alkaline solution of grape sugar is converted by heat into a dark brown body, called *melassic acid*. This acid has a powerful affinity for oxygen, and reduces the Cu O to Cu 2 O . Some of the tests for grape sugar are founded upon this re-action. One of them, known as Fehling’s test, is prepared as follows: A standard copper solution is made from 1 oz. crystallized sulphate of copper, 3 ozs. cream of tartar, $1\frac{1}{2}$ ozs. pure carbonate of potash, 14 or 16 ozs. of a solution of caustic soda, (sp. gr. 1.12,) and water until the solution measures 15,160 water grains; 200 measured grains of this solution contain a quantity of copper that would be reduced by 1 grain of sugar, each atom of sugar reducing 10 atoms of the black oxide of copper to the state of suboxide. Cane sugar is converted into grape by boiling with weak sulphuric acid, and it can then be easily tested by the standard solution. It sometimes becomes necessary to test for sugar in diabetic urine; this is accomplished in various ways. One of

them, called Trommers' test, is as follows: Add caustic potash, and filter if necessary, then dilute solution of sulphate of copper in small quantities; the precipitate that first forms dissolves on stirring, and the solution becomes azure blue, but after standing, a fawn colored precipitate of suboxide of copper will be formed. The conditions and precautions to be observed are fully given in medical works and need not be repeated here. The property of grape sugar to reduce metallic salts is made use of for the preparation of silver mirrors. Add to the nitrate of silver a few drops of ammonia and then some grape sugar, and the metal will be precipitated.

Chloride of silver can also be reduced by grape sugar, and this method affords a way for reclaiming photographic wastes, and of preparing pure metallic silver. Take 14 parts of well washed and still moist chloride of silver, 24 parts of caustic soda, sp. gr. 1.333, $11\frac{1}{4}$ parts ammonia, sp. gr. 0.925; to this add, with constant agitation in a flask, $7\frac{1}{2}$ parts pure honey, or $9\frac{1}{2}$ parts grape sugar syrup, and let the mixture stand in a warm place until sulphuretted hydrogen affords no sign of silver. Decant and wash out all traces of chlorine. The reduced silver can then be dried and melted in a crucible.

Platinum black, finely divided metallic platinum, can be obtained from the chloride by adding carbonate of soda in excess, and heating the solution for ten minutes. The precipitate can be collected in a filter, and then well washed and dried.

Grape sugar crystallizes in warty, cauliflower concretions composed of hard transparent cubes. It is less soluble in water than cane sugar, but more soluble in alcohol. Two and a half parts of glucose are required to produce the same sweetening effect as one part of cane sugar. Sulphuric acid does not decompose it, but forms a definite acid with it, called sulpho saccharic acid. It forms a double salt with common salt.



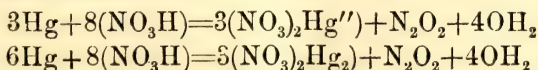
It also forms definite but unstable combinations with the alkaline bases.

From the foregoing it will be apparent that grape sugar can be easily and cheaply prepared, and that it is capable of many important uses in the arts if it could be manufactured in adequate quantity and at a reasonable rate.—*Journ. of Applied Chemistry, New York, June, 1870.*

OINTMENT OF MERCURIC NITRATE.

BY R. ROTHER.

One of the most serious imperfections of the Pharmacopœia is its process for the ointment of mercuric nitrate. This is a failure in every respect, the nomenclature not excepted. The ever-recurring difficulties that the officinal formula engenders have caused the accumulation of abundant literature designed to obviate or remove some of these inherent obstacles. But even the enumeration of all the known processes has been of no avail. Most of the modifications that have been suggested are based upon the officinal process itself, and consist mainly of alterations in the proportion of the ingredients or their quality. But the officinal process is in the full sense of the term irrational; likewise must be any other which grounds itself upon this. Therefore the solution of this profound problem cannot be discovered in the components of the formula, but must be sought for in the operation alone. A review of all the known facts connected with the history of this preparation reveals as follows: Firstly, since the value of this combination is generally recognized, the title should be distinctive of its character. In this regard the Pharmacopœia completely fails. If the solution of the metal is officinally effected in contact with the acid at the ordinary temperature, it is positively certain that both mercuric and mercurous nitrate form, even in the large surplus of acid shown by the precipitation of mercurous chloride in the presence of chlorhydric acid, consequently the ointment will receive both nitrates from the beginning. Evidently, the lower the temperature at which the solution is made the greater will be the proportion of mercurous nitrate, in the same ratio the remaining acid, and through it the more powerful the oxidation of the fats. But the intenser the reaction the more probable will be the reduction of the mercurial salts, and especially the mercurous nitrate, which is eminently dissimilar in its effects and molecular constitution to the mercuric salt. The following equations will sufficiently illustrate the above:



When these mercurial solutions come in contact with the heated glycerides, the complicated reaction which immediately ensues commences with two distinct phases. One of these is characteristic only for the so-called non-drying oils; the other is pretty general with all. The first of these is determined by the catalytic action of the nitrogen tetroxide (which is always present in the mercurial solution prepared without heat, and should it not be present, as would be the case by employing a solution containing the mercuric nitrate only, it would of course simultaneously result from the mutual decomposition of the nitric acid and the fats), and consists in the transformation of the liquid triolein into its white concrete and crystalline isomere elaidin. But the second, which is characterized by the violent evolution of volatile products, consists, according to the prolongation of the reaction or its intensity, favored by external causes, and the relative quantity of nitric acid, of the destruction of part of the oleic, palmitic and stearic acid contained in the glycerides that are usually employed.

But the complete dissociation of the original compounds is effected with difficulty. Pure lard, heated with 8 and 10 times the quantity of strong nitric acid until the latter was dissipated, still was attacked by a fresh portion. In this case, all of the 9 volatile acids of the series $C_nH_{2n}O_2$, from acetic to capric inclusive, are produced together with fixed acids of the series $C_nH_{2n}-2O_4$, of which suberic and succinic acid are more abundantly produced from glycerides containing chiefly palmitin. A peculiar and undetermined substance is invariably generated in quantity, and resists the destructive action of the nitric acid with remarkable obstinacy. This is an intensely yellow oil, which saponifies with potassium hydrate, with the formation of a deep red color; and it is this compound to which the ointment of mercurial nitrate owes its yellow color. It is supposed that the discoloration of the officinal ointment occurs more particularly when the oxidation of the fatty matter has not been sufficient, and that subsequently the avidity of these bodies robs the mercurial salts of their oxygen and reduces them to the metallic state; but in the officinal ointment the greater part of the mercury no longer exists as normal nitrate, but chiefly as basic nitrate and mer-

curous or mercuric salts of some of the fatty acids either originally existing in the fat or as products of its decomposition. This is amply evidenced by employing a drying oil, as the oils of cotton or flaxseed, in the preparation of the ointment, which of course, as will be seen, are entirely inadmissible for this purpose. If flaxseed oil, for instance, is heated with nitric acid alone, even until the latter is entirely consumed, no separation will take place; but if to the heated oil the mercurial solution be added, a greenish-yellow agglutinated mass immediately separates, which adheres to the bottom of the vessel and the stirrer too tenaciously to admit of distribution, and moreover hardens on cooling to the consistence of lead plaster. Strong cold nitric acid has no apparent action on this substance; neither have oil of turpentine, alcohol, ether and carbon disulphide, when repeatedly treated with these solvents in succession; but chloroform dissolves the greater part of it, leaving a grayish, light, flocculent deposit, which agglutinates on the addition of alcohol. Cold strong nitric acid attacks this powerfully, forming a green solution containing abundance of mercuric oxide. At the same time a yellow, oily substance separates, which completely dissolves in chloroform—also in ether, but slowly and imperfectly in alcohol—to an intense yellow color, and saponifies with potassium hydrate to a deep red color. The original resinous substance, as it separates from the supernatant oily liquid, is but faintly acted on by cold strong nitric acid; but the same acid when hot dissolves all but a yellow oil which separates from the solution, and contains mercury in abundance, as the black precipitate with ammonium sulphide indicates. The first chloroformic solution of the resinous deposit when evaporated leaves a reddish-yellow, varnish-like residue, which is insoluble in water, but readily saponifies with potassium hydrate to a red solution, whilst a small quantity of mercurous oxide at the same time separates. By the addition of nitric acid to a solution of this soap, a yellow precipitate again occurs.

The separation of this resinous deposit at the very outset of the operation goes to show how easily the mercurial nitrates are reduced by heat, or, more particularly, by the combined influence of temperature and the reducing property of the organic

substances, even in the presence of a large excess of free nitric acid, which seems to indicate, in this instance at least, that the replacement of the hydrogen atom of the acid molecule through the mercurial atom renders it more unstable in the presence of organic matter, and therefore a more powerful oxidizer.

The evolution of nitrogen dioxide during the solution of the resinous remnant insoluble in chloroform would also indicate that the body contained either metallic mercury or the suboxide. This supports the supposition that the mercurous compounds are less stable than the mercuric under similar circumstances. It also affords incontrovertible evidence that in the officinal ointment the smallest portion of the mercury exists as nitrate, and that the greater portion can be present in an indefinite variety of forms. Therefore, the only form in which the metal should be combined is as mercuric nitrate, and the title should designate it accordingly.

Secondly—A portion of the fatty substance which the formula demands cannot be obtained unless the pharmacist prepares it himself, because an officinal neat's-foot oil does not exist in the market, but a rank and disgusting semi-fluid grease, which possesses none of the officinal characteristics. But pure lard can always be readily obtained, and, since it furnishes an excellent ointment, should invariably be used.

Thirdly—The manner of executing the officinal operation is the very embodiment of failure. In this process it is of the utmost necessity to employ vessels of immense proportionate size. It is a point of great importance to retain the temperature of the heated fats within certain limits, which is an exceedingly difficult office to perform after a violent reaction has set in; and even with all these precautions the ointment may overflow or its color be impaired from reduction of the metal by too great a heat. The production of a good ointment by this process is, therefore, a matter of chance, and depends upon circumstances that seem rather the good luck of the operator than a well-defined pharmaceutical process.

Now all these difficulties can be readily overcome by an entire change in the operation itself, regardless of the component elements of the formula. The new process rests upon a

scientific basis whose characteristic feature pervades it in every detail, and which must therefore invariably yield a uniform and definite result. Two parallel operations, separate and distinct, unite their perfect results to one complete and unchangeable whole. The formation of mercuric nitrate is effected with the requisite quantity of nitric acid, and the remainder is completely consumed in the oxidation of the fats. This insures the ultimate existence of but one compound of mercury in the finished product, and that is, as the title implies, the mercuric nitrate. It likewise admits of the oxidation of the fatty matter to the utmost capacity of all the available nitric acid, so that when the last vestige of this has disappeared the mercurial solution can be mixed with the nearly-cooled product without causing any farther reaction. A very decided advantage of this process is that the enormously large vessels can be dispensed with. The nitric acid is added to the melted fat, and the heat continued until brisk ebullition sets in. This occurs mainly in the centre of the mixture, and without frothing. It is, however, of the utmost necessity not to disturb the liquids by stirring. If the reaction becomes too violent, the mixture must be removed a short time from the fire; and if the action slackens too much, it must be replaced. Finally, when all the nitric acid has been decomposed, the temperature can be considerably raised without causing any farther effervescence. The boiling then is analogous to the boiling of fatty matters in general.

From the foregoing results the following formula is deduced :

Take of Mercury	$1\frac{1}{2}$	troyounces.
Nitric Acid, sp. gr. 1.42, . . .	$3\frac{1}{2}$	“
Lard (pure)	$16\frac{1}{2}$	“

Dissolve the mercury in 900 grains of the nitric acid, with the aid of heat, and keep the solution gently warm to prevent crystallization before it is used. Melt the lard in a suitable vessel, with a moderate heat; then add the remainder of the nitric acid, and continue the heat, *without* stirring the mixture, as long as moderate effervescence continues; but if this becomes too violent, remove the mixture from the fire, and only replace it when the action slackens too much. Finally, when effervescence ceases and the liquid only boils even under an increased heat, remove

the mixture from the fire altogether; and when it begins to stiffen, add the mercurial solution, and mix thoroughly.—*The Pharmacist, Chicago, July, 1870.*

REPORT ON CINCHONA CULTIVATION IN BENGAL.

From C. B. CLARKE, ESQ., M.A., *Officiating Superintendent, Botanic Garden, and in charge of Cinchona cultivation in Bengal, to the Secretary to the Government of Bengal*,—(No. 188, dated *Botanic Garden, Calcutta, the 29th April, 1870.*)

Sir,—I beg leave to submit the annual report on the cultivation of Cinchona in Bengal for the year ending 31st March, 1870.

2. The three species of cinchona of which the cultivation has been extended during the year are *C. succirubra*, *C. officinalis*, and *C. calisaya*.

The number of plants of these species in permanent plantations were as under:—

	<i>C. succirubra.</i>	<i>C. officinalis.</i>	<i>C. calisaya.</i>
March 31, 1869	615,730	312,719	220
March 31, 1870	1,055,100	406,859	4,000
Increase	439,370	94,180	3,780

3. The increase of permanent plantation of *C. succirubra* and *C. calisaya* has been made about Rishap at an elevation of 2500 feet; the increase of *C. officinalis* at Rungbee at an elevation of about 4500 feet.

4. The average growth for the year of the ten measured plants of *C. succirubra* planted in March, 1867, at Rishap, has been 51 inches, which fairly represents the satisfactory general growth of the *C. succirubra* plantations.

5. The average growth for the year of the ten measured plants of *C. officinalis* planted in October, 1864, at Rungbee, has been 12 inches, which fairly represents the unsatisfactory general growth of the *C. officinalis* plantations.

6. The average growth for the year of the ten measured plants of *C. calisaya* planted in June, 1867, at Rishap, has been 52 inches, which represents the average growth of all the plants in the plantation catalogued as *C. calisaya*. But several important varieties are included under the name *C. calisaya*, and the tree variety raised by seed in February, 1867, and planted out in June, 1867, has attained a height of 12 feet in October, 1869, and a tree of this age, lately cut down, has produced two pounds of dry bark.

7. As fully explained by Dr. T. Anderson in his annual cinchona report in Bengal for the year ending 31st March, 1868, the exceeding steepness of the hills, combined with the large rainfall, prevents any tilth on these cinchona plantations. The grass and low jungle having been cut close, the young cinchona plants are planted out in the permanent plantations. The weeds having been merely headed down, not eradicated, grow with great strength in a moist and warm climate, and continual scouring of the young plantations is necessary. This is the chief expense under this system of cultivation.

8. *C. succirubra* and *C. calisaya* (tree variety) grow so freely, that by the third year the young trees in the plantations are all locked; they then crush the jungle beneath them, and can take care of themselves, and little further expense upon them is called for.

9. But *C. officinalis* shows no inclination to become a tree at these plantations; it remains a shrub with very scanty foliage, and even on the plantations which are five years old, there continues the same expenditure in scouring.

10. *C. succirubra* and *C. calisaya* are planted about 1200 to the acre; *C. officinalis* about 4000 to the acre.

11. In the fifth year of growth in permanent plantation an acre of *C. officinalis* carries less than one-fourth the bark carried by an acre of *C. succirubra*, and costs more than four times as much annual expenditure. Moreover, the *C. officinalis* then appears disinclined to grow much larger, whereas *C. succirubra* will clearly grow into a considerable tree.

12. I calculate that at present it has not been discovered how to grow *C. officinalis* to economic profit at Rungbee. I there-

fore stopped its extension in September last, though I was aware of the high quality of the grey bark. The present quantity is large for an experiment; and, as an experiment, a few acres of *C. officinalis* were planted in September last at a somewhat higher level (5000 feet) than the main plantation. Also, in all the *C. officinalis* plantations below the level of 4000 feet (above which level *C. succirubra* does not thrive), *C. succirubra* has been planted between the ranks of *C. officinalis*, and will, doubtless, soon overgrow it.

13. The propagation and extension of *C. calisaya* has been pushed as fast as possible. There is no difficulty in multiplying *C. succirubra* and *C. officinalis* by cuttings, but at Rishap there is found the greatest difficulty and uncertainty in multiplying *C. calisaya* by cuttings. Herr von Gorkom, the Director of the Dutch Government cinchona cultivation in Java, informs me that there the same difficulty with *C. calisaya* is found; but, on the other hand, Mr. M'Ivor, in the drier climate of the Nilgherries, says cuttings strike with perfect success.

14. Herr von Gorkom has sent me on several occasions most valuable packets of *C. calisaya* seed, which germinated excellently; but if it could be discovered how to grow *C. calisaya* by cuttings, I should greatly prefer that method, as by it I am sure of getting exactly the variety which I wish to propagate. Mr. M'Ivor is of opinion, that not merely do the varieties cross freely, but that many hybrids are formed from different species of cinchona.

15. The most valuable bark known in the European market is the *C. calisaya* bark; this species grows admirably at Rishap, and, during the past year, propagation has been almost entirely confined to it. In growing for profit, I believe it will ultimately be found advisable to grow one or two species only on these plantations; and that it is best to discard a species at once which is clearly inferior with us to *C. calisaya* and *C. succirubra*.

16. I have lately brought from the Nilgherries two new kinds of cinchona, one provisionally named *C. mirabilis*, of Mr. Broughton, the other *C. pitayo*. In *C. mirabilis* the bark contains the astonishing quantity of $13\frac{1}{2}$ per cent. of quinine alkaloid, and more than 9 per cent. of crystallizable quinine. *C.*

pitayo is a rich bark from Peru, a very high-level species, said to be found growing through the snow.

17. During the year both *C. succirubra* and *C. officinalis* ripened seeds; $5\frac{3}{4}$ ounces of the former and $5\frac{1}{4}$ ounces of the latter were distributed. One ounce of seed will raise nearly 50,000 plants.

18. There were distributed from Rungbee during the past financial year cinchona plants as under:—

	<i>C. succirubra.</i>	<i>C. calisaya.</i>	<i>C. officinalis.</i>
Mr. Werniche, Kursiong . .	2500	50	
Dr. Jameson, Saharunpore .	1500	260	500
Mr. Robson, Tukvar		200	
Col. Strutt, Kangra Valley.		12	
Total . . .	4000	522	500

19. The amount of propagation having been greatly reduced, a considerable number of the old frames and glass were sold. The receipts for the past year of the cinchona plantation paid into the Darjeeling treasury were as under:

	Rs.	As.	P.
Rent from land let	1130	0	0
Price of a wardian case . . .	10	0	0
Sale of cinchona plants . . .	156	4	0
Sale of old glass	187	8	0
Total . . .	1483	12	0

20. The total expenditure for the year on the Sikhim cinchona cultivation was Rs. 50,224, being Rs. 18,642 less than the estimate, and Rs. 18,040 less than that of the preceding year.

21. The *C. succirubra* trees stand 6 feet by 6 in the plantations, and, as an experiment in January last, a small portion of the denser plantation was thinned by cutting down three trees out of every four. This was found to produce 300 lbs. of dried bark, worth about Rs. 250 per acre.

22. At the same time a considerable portion of the more advanced trees were pruned by the removal of the lower branches. There was stored from the thinnings and prunings in all 2400 lbs. of dried bark.

23. The only private plantation in Sikhim, which (so far as I know) is extending cinchona planting on a considerable scale, is that of Mr. Lloyd and Colonel Angus, known as the Darjeeling Cinchona Association, and which occupies the north side of the Rungbee valley. This Association has now about 500 acres of permanent plantation of *C. succirubra*, and has cut a considerable quantity of the three-year-old bark during the late cold weather, and sold it in the London market.

24. The Government cinchona plantations at Nunklow, in the Khasi Hills, was formed for the supply of cinchona plants to the planters in Assam and Cachar. Seed is now easily transmitted, and I believe the discontinuance of the plantation at Nunklow has been decided upon by Government.

Number and distribution of Cinchona plants in the Government plantations near Darjeeling on the 31st March, 1870.

Name of species of cinchona.	Number in permanent plantations.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in cutting beds.	Number of cuttings made during the month.	Total number of plants, cuttings, and seedlings.
<i>C. succirubra</i>	1,055,100	20,000	164,615	None	None	1,239,715
<i>C. calisaya</i>	4,000	10,000	8,758	32,274	2,000	57,032
<i>C. micrantha</i>	29,667	None	None	None	None	29,667
<i>C. officinalis</i> , and varieties.	406,899	10,000	205,952	307,853	Ditto	930,704
<i>C. pahudiana</i>	5,092	None	None	None	Ditto	5,092
Total	1,500,758	40,000	379,325	340,127	2,000	2,262,210

C. B. CLARKE,

Officiating Superintendent, Botanic Garden, and in charge of cinchona cultivation in Bengal.

—*London Pharm. Journ. Aug. 6, 1870.*

THE PRODUCTION OF IODINE AND BROMINE.

BY W. H. CHANDLER.

To Scheele is the world indebted for the first intimation of the elementary existence of fluorine and chlorine, he having in 1771 referred the action of sulphuric acid upon fluor-spar to the freeing of a distinct acid from the mineral, though whether fluorine has, even up to the present day, been isolated, is a matter of great doubt. In 1774 the same chemist isolated chlorine. In 1811 Courtois separated iodine from the waste liquor from the manufacture of soda ash from sea-weed, followed by the discovery of bromine in the bittern of sea-water by Balard in 1826. The isolation of these four closely-allied elements from their compounds is thus included in a century, and the application of them to economical purposes, to any extent, was accomplished since the beginning of the present century. Their close relationship, their physical properties, and their chemical affinities, which are nearly in an inverse proportion to their chemical equivalents, induce one to the supposition that they are modifications of the same element.

The isolation of chlorine, bromine, and iodine from their compounds with the alkalis, is accomplished with equal facility. But the abundant store of the former in the enormous deposits of salt throughout the world and in solution in the ocean and inland seas, forms a striking contrast to the rarity of the two latter halogens. In combination with silver, bromine and iodine are found in some rare ores in Mexico and South America. Chatin claims to have detected iodine in rain-water, though in very minute quantities, and even in the atmosphere. In sea-water traces of it have been uniformly detected, though not in quantities sufficient for quantitative estimation. Bromine exists in slightly larger quantities, and, associated with iodine and chlorine, is found in the ocean and inland seas, the various mineral and saline springs, and salt deposits throughout the world.

According to Von Bibra, the amount of bromine in the Atlantic Ocean, in one United States gallon, is 24 grns.; in the Dead Sea, examined by Herapath, 121.5 grns.; in the dried residue of the Mediterranean, 1.15 per cent.; in the mineral spring of

Kreushnach, Ure found 10·8 grns.; in Kissengen water, determined by Kastner, 0·44 grns.; at Tenbury, in Worcestershire, examined by Dr. Ure, as high as 12·5 grns.; and at Arnstadt, according to Hartung, 13·6 grns. Iodine occurs in far less quantities, from mere traces to 2·2 grns. per gallon, this latter quantity being found in the iodine spring at Halle.

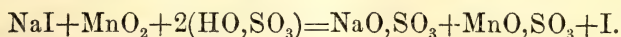
In the United States, both bromine and iodine have been detected in the various saline and mineral springs. Iodine was first detected in this country, in the Saratoga Spring waters, by Drs. Usher and Steel, in 1830, and bromine in the same waters by Dr. A. A. Hayes, and in the salines of Onondaga by Prof. B. Silliman, in the same year. The quantity of bromine in the spring waters of Saratoga county, determined by Prof. Chandler, reaches 3·63 grns. per gallon in the water of one of the Artesian wells, the largest amount of iodine found being 0·2 grn.; but in this country, as in Europe, it is in the salines that the quantity of these substances becomes of economical importance, and in a brine of the Saginaw valley, Dr. Chilton found 7·65 grns. of bromine; at Tarentum, Pa., 6 grns. bromine and 4 grns. iodine were reported by Stieren; in the Salina brine analyzed by Prof. Goessmann, however, only 1·86 grns. of bromine per gallon are reported.

Besides these various sources, iodine has been detected in the soda deposits of Peru, in the ashes of sponges, and in the ashes of the Spanish barilla plants. Cod-liver oil is said to owe some of its medicinal properties to a trace of iodine. Though the distribution of bromine and iodine is thus very general, yet owing to their existence in such comparatively minute quantities, the sources of our commercial supply are much more restricted.

Up to the beginning of this century the alkalies of commerce were derived from the ashes of plants, and the burning of sea-weeds was an important industry, especially in Great Britain and Ireland.

The amount of ashes of sea-weed, the so-called kelp, reached its maximum production in 1800, when 20,000 tons were collected. To produce this, 400,000 tons of wet weed were burned. From this time, owing to the removal of the import duty and to the introduction of the manufacture of soda ash from common salt,

the trade declined. But the discovery of iodine in the mother-liquors of kelp salts, somewhat revived the manufacture,—and it is to this source alone that the total supply of iodine in commerce is due. The high price stimulated the business, and in this country, in a few places in New England, iodine factories were established. These latter, however, were soon abandoned, the weed upon our coast being of poor quality. The process of separating the iodine is exceedingly simple, being nearly analogous to that for the isolation of chlorine. The ashes are leached with water, and the various crystallizable salts of potash and soda are separated by concentration. Carbonates, sulphates, and chlorides of potash and soda are thus removed, leaving in solution sulphite, hyposulphite, and some carbonate of soda, together with the iodides and bromides. By the addition of sulphuric acid the first three salts are decomposed, and the sulphate of soda produced is removed by crystallization. The concentrated mother-liquor is acidulated with sulphuric acid, and after the addition of binoxide of manganese, the iodine and bromine distilled off. The reaction may be represented thus:



The bromine of commerce was derived mostly from salines until the salt mines of Stassfurt were opened; the Schoenebeck salt springs, near Magdeburg, producing the greater part of the supply for Germany. The method of manufacture is similar to that followed in the separation of iodine.

Upon opening the mines of Stassfurt, bromine was found in the mother-liquors in considerable quantities, and at present the principal part of the European product is derived from this source. As high as 300 grns. per gallon has been obtained from these mother-liquors. Although but two or three of the manufactories at this place have economized this substance, the price of bromine has greatly decreased during the last five years. This decrease has been hastened by the large production of bromine in the United States.

Although the amount of bromides in the Saratoga waters is considerable, yet the comparatively limited flow of water here and the large consumption of these waters for medicinal pur-

poses precludes the manufacture. But from the strong salines our supply is derived in large quantities. At Tarentum, Sligo, and Natrona in Western Pennsylvania, Pomeroy, Ohio, and Kanawha, West Virginia, the manufacture of bromine has become of considerable importance. The production of 1870 will reach 125,000 lbs., a quantity probably in excess of our consumption. In 1867 the Stassfurt product of bromine was nearly 20,000 lbs.

The total product of iodine in Great Britain and France is about 200,000 lbs. annually, and outside these two countries very little is produced. As the average product of iodine is about 10 lbs. to the ton of kelp, and it requires 20 tons of wet weed to produce one ton of kelp, this total product represents the burning of 400,000 tons of sea-weed. At the present price, the iodine produced is of more value than the alkaline salts, which were the original object of the industry.

As previously stated, iodine is not produced in the United States. Since its use was first established here the price has fallen from \$16.00 to about \$5.00 per lb. At present, bromine is furnished for less than \$1.50 per lb.

The chief consumption of bromine and iodine is for medicinal purposes in the form of iodides and bromides of potash, soda, or ammonium. A small proportion is consumed in photography. Bromine has been proposed as a discharge in calico printing, and during the late war was to some extent employed as a disinfectant. As yet, but a small proportion of the bromine of the saline mother-liquors is economized; but should the manufacturers turn their attention to this important substance, the consequent reduction in price will render its economical employment in other directions possible.—*Amer. Chemist*, Aug., 1870.

NEW SULPHUR DEPOSIT.

Sulphur is a substance which has, if not a fragrant, at least a decided odor, and is useful, both internally and externally. Besides these purely personal uses, it is largely used in this country in the manufacture of sulphuric acid, and for other manufacturing purposes. As a matter of course the source of supply be-

comes a matter of consequence, especially to proprietors of extensive manufacturing works.

We are glad, however, to know, and to be the first to announce, that a source of supply has been discovered much nearer home. It is in the Island of Saba, which is one of the Dutch West Indies, and is situated about 110 miles south-east from St. Thomas, and 40 miles south-west from St. Martha's. Like its Italian prototype, the island is of volcanic origin, being about eleven miles in circumference, and at its highest point about 2,800 feet above the sea. Though a Dutch possession, the language spoken by its two thousand inhabitants is chiefly English.

The sulphur deposit referred to was discovered by an enterprising New Yorker, who found himself there on a search for health, and, finding indications of sulphur ore, set to work with pick and shovel, and with the help of some natives quarried two sloop loads, which he brought here and submitted to analysis.

The report of the chemists employed is to the effect that while the Sicily ores only yield about thirty per cent. of brimstone for the ore consumed, the Saba ore yields an average of over sixty per cent. Adding to this the fact that the island is only about fifteen hundred miles from New York, it will be seen that this is an important discovery, and it need not be wondered at that steps have already been taken to secure leases of the best tracts on this island. We understand that this has been done, and that the importation of crude brimstone will soon be commenced. —*Drug. Circular, New York, June, 1870, from N. Y. Times.*

THE ROASTING OF COFFEE.

In distilling a cold prepared extract of roasted coffee with lime or magnesia, an alkaline distillate is obtained, which by evaporation after the addition of hydrochloric acid, and extracting with alcohol, yields a pure chloride of methylammonium. This salt is a chloride of ammonium, in which one equivalent of hydrogen is substituted by methyl, the radical of methylated spirit or methyl alcohol, this being the lowest one in the series of alcohols, of which ordinary alcohol and ether are representatives. This product is formed by the decomposition of caffein, when

combined with tannic acid, as is the case in all coffees, pure caffeine yielding different products of decomposition, among which is cyanogen. In roasting coffee part of the caffeine is volatilized together with some methylammin, while the larger amount remains with the coffee itself. Half of the caffeine of the coffee is decomposed in this way; one sample, which before roasting tested 1.45 p. c., yielding afterwards only 0.65 p. c. of caffeine. The temperature at which these changes are effected is, in the case of green coffee (Porto Rico), 275° C.; in the case of yellow coffee (Java), $250-255^{\circ}$ C.

Caffein is soluble in bisulphide of carbon and in benzole; in benzole especially, to such an extent that it may be used with advantage for the preparation of the pure alkaloid.—*Drug. Circular, New York, June, 1870.*

AMMONIA GUNPOWDER.

By M. A. JOUGLET.

The owners of the Nora-Gyttorp Powder Mill, Sweden, have brought out a new kind of powder, which contains, it appears, a mixture of nitrate of ammonia and nitrate of potassa (with what other substance is not said). This material is, according to some accounts, a more powerful explosive than nitro-glycerin, and cannot be ignited, or made to explode, but by the impact of a blow, or a falling weight, or by the detonation of a small cartridge containing common gunpowder. Experiments made at a military establishment at Berlin with this powder have proved that, while ordinary gunpowder, gun-cotton, nitroglycerin, and dynamite take fire the moment flame is approached, this powder did not do so. As regards the effect of the impact of a blow of a falling weight (the same, of course, in each case), ordinary gunpowder requires for explosion that the weight falls from a height of between 4 and 5 ft.; nitro-glycerine, $1\frac{1}{2}$ ft.; dynamite, $2\frac{3}{4}$ ft.; and ammonia gunpowder, between 12 and 15 ft. A sample having been sent to France from Berlin did not, the author says, confirm the high opinion this substance is thought worthy of in Prussia.—*Chemical News, London, Feb. 25th, 1870.*

UNGUENTUM SABINÆ.

By T. H. BATEMAN.

To judge from the limited demand for this ointment, it does not now find much favor among the medical profession generally, although, in the opinion of some eminent surgeons, forming one of the best external irritants and escharotics we have, acting much more efficiently in keeping open blisters, etc., than does the ung. elemi of the British Pharmacopœia, which, to some extent, has taken its place.

Looking at this ointment from a pharmaceutical point of view, it is exceedingly unsatisfactory; the specimen I have before me (supplied by a London wholesale house) is perfectly rancid, and resembles in appearance "old green elder ointment."

Dr. Royle says, "When made in a porcelain vessel, or a water-bath, it is of a yellowish-green color, efficient and active, and will keep good for a long time," which it certainly does not, as far as my experience goes.

The B. P. orders fresh savin-tops, collected in spring, to be used, thus compelling manufacturers to make their year's stock at once, which is decidedly objectionable, as it is thus frequently sent out rancid. Although this condition does not in any way interfere with its effect as an irritant, yet it prevents its coming under the category of "elegant preparations."

Pharmaceutists (excepting those in a large way) are in the habit of trusting to their wholesale druggists for it, the demand, as a rule, being too small to justify their making even the quantity ordered in the Pharmacopœia; besides, made on a small scale, it is exceedingly wasteful, the savin-tops being so bulky as to render it difficult to strain the ointment from them.

For satisfaction's sake I have prepared some myself, adopting the following somewhat modified formula, which differs only from the B. P. in the addition of gum benzoin:—

Fresh Savin-tops (bruised)	. . . . .	8 oz.
Yellow Wax	. . . . .	3 oz.
Prepared Lard	. . . . .	16 oz.
Gum Benzoin (coarse powder)	. . . . .	1 oz.

Melt the wax and lard on a water-bath, add the gum benzoin, and

digest for half an hour, constantly stirring, then add the savintops, and further digest for twenty minutes; lastly, strain with pressure through calico or flannel, stirring occasionally until cold.

Resulting ointment, pale yellowish-green, with the odor of savin distinctly marked, which odor I have failed to detect in most, if not all bought specimens. The addition of gum benzoin (judging from its preservative effect on other ointments) will, in this case, I hope, tend to prevent any decided change from taking place.—*Pharm. Journ.*, July 2, 1870.

Manbey Grove, Stratford, June 2d, 1870.

ON THE USE OF TINFOIL FOR PRESERVING SUBSTANCES LIABLE TO CHANGE ON EXPOSURE TO AIR.

BY ERNEST BAUDRIMONT.

Tin reduced to thin sheets has for many years been employed for preserving a great number of substances from the action of air and moisture. The thin leaves (foil) of this metal are essentially repellent of moisture. When cemented to the surface of damp walls, they protect the paperhangings which may be afterwards applied, and they are in like manner used for lining the interior of boxes and drawers in which dried medicinal leaves and flowers are kept. It has long been the practice to enclose chocolate in tinfoil, to prevent the fatty matter contained in it from soiling the paper which forms the outside wrapper; in the same way butter of cacao itself is preserved, and some sorts of sweetmeats, sausages, and cheese are among the articles similarly protected. Tobacco-pouches are lined with tinfoil to preserve the flavor and humidity of the tobacco. Cakes of opium are kept in a moist and uniform state by wrapping them in this material, and bisulphate of soda is kept in the same way, for use in making artificial Seltzer water with Briet's apparatus. Lastly, on account of the opacity of tinfoil to the rays of light, bottles are coated with it for the purpose of excluding light from vegetable substances which would be injured by its action.

Notwithstanding the knowledge of all these facts, it might be said that the application of tinfoil for the preservation of sub-

stances liable to change is still rather limited, and there seemed to be a prospect of its admitting of a more general use than has hitherto been made of it. At the same time there was an absence of any precise experiments for the purpose of determining in a scientific manner the degree of impenetrability of tinfoil. Having been engaged for some time in the investigation of this subject, I have obtained the following results:—

For many years past I have observed that cacao butter, which readily becomes rancid even when kept in bottles into which it has been introduced in the melted state, if the bottles be opened from time to time, does not undergo the same change when moulded in tablets and wrapped in tinfoil. This fact, which was confirmed by many observations, and could only be explained by assuming the impenetrability of tinfoil to atmospheric air, formed the starting-point for some experiments in the same direction, which proved satisfactory. Thus, a piece of well-burned quicklime, enclosed in a double wrapper of tinfoil, was exposed in the atmosphere of the laboratory by the side of another similar piece which was exposed without protection. While the latter became slacked, that which was protected by the tinfoil, and weighed 92.2 grams on the 1st of December, 1867, had only gained 3 decigrams in weight at the expiration of a month, and after being kept until the 25th of March, 1868, it had only increased to 94 grams. It had thus gained only 1.8 grams in four months. On being then taken out of its metallic envelope much heat was developed from absorption of moisture, and it fell into powder.

Satisfied by this experiment of the efficacy of tinfoil for preserving bodies from the action of air and moisture, it seemed probable that substances the most susceptible of change might be kept in the same way. It was found that substances so deliquescent as chloride of calcium and liver of sulphur, and efflorescent salts such as carbonate and sulphate of soda, remained almost unchanged when wrapped in tinfoil, increasing or diminishing only to a few thousandths of their weight in several weeks.

Other experiments were made of a more precise character. It is well known that fresh lemons become rapidly dried and ultimately hard when exposed to the air, and that they also become perished and covered with mould. I had endeavored to

prevent this drying and moulding by placing the lemons in close vessels, in dry air, in sand, and also in bran, but none of these methods proved efficacious. Thus, for example, in twenty-one days the lemons lost on an average, 17·33 per cent. of their weight in sand, and 17·13 per cent. in bran. Experiments were made for the purpose of ascertaining the effect of enveloping the fruit in tinfoil, and also of coating it with a film of collodion. Some of the fruit prepared in each way, and some unprepared, was weighed, exposed to the air, and again weighed at intervals of a month. This method was applied to lemons and oranges, and the following results were obtained:—

1. The unprepared fruit became rapidly dried. In two months the lemons had lost 42 per cent. of their weight, while the oranges, in the same time, had lost only 26 per cent.

2. Collodion, when applied to the fruit alone, exerted but a feeble preservative influence in retarding spontaneous evaporation. In two months lemons coated with collodion had lost 29 per cent., and oranges 22·5 per cent.

3. Tinfoil almost entirely prevents the drying of the fruit. In two months lemons lost only 1·58 per cent., and in three months 3·16 per cent. In one case, indeed, the loss was only 0·92 per cent. during the longer period. Oranges lost about 5 per cent. in two months. On the removal of the metallic envelope, the fruit was found to be as fresh and fragrant as when the experiments were commenced. These observations and experiments will tend to show the remarkable power of tinfoil in preserving substances enclosed in it from the influence of air and moisture derived from air, and may induce those who are interested in the subject to extend the application of this preservative means.—*Lond. Pharm. Journ.*, July 2, 1870, from *Journ. de Pharmacie et de Chemie*.

CULTIVATION OF IPECACUANHA IN INDIA.

The Supplement to the "Gazette of India" of 23d January, 1869, contained a strong representation to Government from the Inspector-General of Hospitals, dated 5th October, on the advisability of introducing the cultivation of the ipecacuanha plant in an analogous manner to that of cinchona.

The suggestion was forwarded to Dr. Anderson, the Superintendent of the Botanical Gardens, Calcutta, who stated that he had, for some years past, thought of the subject, but had been unable to procure any plants on trial until April, 1866, when one plant was sent out overland by the Director of the Royal Gardens at Kew. This original plant died soon after arrival, but, at the date of his writing, December, 1868, nine plants were in existence, artificially propagated from the original one, besides five growing at the cinchona plantations at Darjeeling, to which place a cutting had been sent in 1867.

The "Indian Medical Gazette," on the authority of Mr. Clarke, now acting for Dr. Anderson, quotes the remarks of that gentleman:—"When I took charge of the Gardens, in 1869, there were seven plants, all under glass, and in a very low state of vegetation. The plant had been found to grow very slowly, and, moreover, to be very shy of propagation by cuttings.

"It is very possible that when the plant once gets up, it may not prove slow-growing, and that when we once have plants that seed, it may not prove slow of propagation; but I fear many days will elapse before any produce is likely to be obtained."—*Lond. Pharm. Journ.*, July 2, 1870, from *The Medical Press*.

ON THE COMPOSITION OF CHLORODYNE.

BY THOMAS STRETCH DOWSE, M.D.

It appears to me very unfortunate that the endeavors of gentlemen to elucidate the much-vexed question as to the composition of chlorodyne cannot be carried on through the medium of your Journal without giving rise to feelings so totally foreign to the subject. The displays of rhetoric by "A Provincial" are worthy of a different, if not a better cause. But I fear they will in no way tend to approximate and elaborate the evidence so kindly rendered by himself and others towards the solution of this controversy, and I do not think the remark uncalled for when I say that if this subject, which appears to be of some interest in a medical and chemical point of view, is to be associated with such feelings as were evinced in the letter of your last number, the sooner the discussion ends the better. It is not by such means that we shall be able in any way to arrive at a

definite result ; and, after a careful survey of the correspondence which has been kindly permitted to occupy the pages of the "Pharmaceutical Journal," I am sorry to say, quite contrary though it be to the opinion of one of your correspondents, that the composition of Dr. Brown's chlorodyne is by no means cleared up. At the same time, before proceeding further, I must state that every respect and consideration ought to be paid to the careful chemical investigation of Mr. Smith,* which I consider, of all others, the most to be relied upon. *Facta non Verba versus Verba non Facta* ; and, in making this remark upon Mr. Smith's formula, I do so upon the grounds that his analysis was carefully and skilfully conducted, and that his formula is based upon such investigation, that is, by the result of actual experiment, meaning by this *prima facie* evidence. Although I credit this able analyst with using his best powers to arrive at the chemical composition of Dr. Browne's chlorodyne, —and doubtless he is absolutely correct as far as his analysis goes,—yet I feel persuaded there is something more in it which Mr. Smith has failed to detect, and I believe this to be belladonna. Mr. Smith frankly, and without reservation, admits that the positive detection and isolation of the alkaloids in complex organic mixtures is not always a very easy task, more especially when they exist in small proportions. And again, Mr. Smith states "all my attempts to obtain the evidence of atropia failed." Here, then, we have both positive and negative evidence. No one can doubt from his own assertion the inability of even a scientific analyst like Mr. Smith to discover the small traces of atropine which exist in a complex organic mixture like chlorodyne. How frequently has it been the case, in times past, that the analyst has been unable to discover the presence of strychnine in organic mixtures, when the physiologist has come forward, and rendered its existence indisputable by the tetanic action produced upon the frog ! and the mere fact of the chemist being unable to detect atropine in chlorodyne does not for one moment destroy my belief in its presence, as I maintain that I have proved physiologically, beyond doubt, that belladonna is present. At all events, if I have not proved satis-

* See page 263 of the present volume.

factorily that belladonna does exist, there ought not to be a doubt in the mind of any accurate observer of the action of the alkaloids upon the nervous system but that chlorodyne even does contain a something, which modifies and changes the characteristic action of morphia which every one admits to exist in this compound, and which some believe to be its only active narcotic agent. As in my last letter I appeared to base my belief in the presence of belladonna principally from the effects observed in the case of poisoning there narrated, I will in this communication endeavor to show my experience concerning the action of chlorodyne both with and without belladonna. Dr. Kidd states positively that two preparations of chlorodyne are free from belladonna, if not all. But these bare and brief remarks, as a previous correspondent says, call for limited comment, so I shall pass them by. But I must have a word with your correspondent of last February, and try to meet him upon his own ground, as his reasoning is not only fallacious, but conspicuous for superficial observation. The following are some of his reasons for disagreeing with my *plausible* suggestion as to chlorodyne containing belladonna:—1st. He says, I have never known it, even in full doses, produce any result at all similar to the well-known effects of belladonna. Let me ask him what are the well-known effects of belladonna in ordinary doses? As far as my experience serves me—and I have been in the habit of prescribing this drug for some years—they are, dilatation of pupil, relaxation of muscular spasm, somnolency, vertigo upon first getting out of bed, and, when continued, impaired vision (certainly not contraction of the pupil). Has he never found any of these symptoms after a full dose of chlorodyne? Again, let me ask him, has he ever found contraction of the pupil after a full dose of chlorodyne, as he would most decidedly do, if, as he asserts, its active ingredient is nothing more or less than morphia? Or, again, has he carefully compared by clinical experience, as I have done repeatedly, a mixture of chlorodyne with and without belladonna? I most certainly think not. If so, he would have arrived at a conclusion rather different, as the following will prove. I took three chlorodynes, viz., Dr. Collis Browne's, one made according to Mr. Smith's form without

belladonna, and another with belladonna added. I selected three male patients with whom I found morphia to agree. They were not habituated to taking either chlorodyne or morphia, neither had they any organic disease. Such, I thought, fair subjects for notifying how far the symptoms produced by each were similar or dissimilar. First, I will commence with patient No. 1. To this man I gave thirty drops of chlorodyne prepared according to Mr. Smith's form. In half an hour he appeared drowsy, but did not sleep. There was slight headache and nausea. I therefore repeated the dose; in half an hour he was in a sound sleep. Upon awaking, which he did in seven hours after taking the second dose, his pupils were contracted to the size of a pin's head. No. 2. To this man I gave thirty drops of chlorodyne prepared according to Mr. Smith's formula, with the addition of the $\frac{1}{100}$ th of a grain of atropine. In half an hour, or little more, he was in a sound sleep; and upon awakening, in three hours, his pupils were dilated. No. 3. To this man I gave thirty drops of Dr. Collis Browne's chlorodyne; and, as no sleep was produced in an hour's time,—only a feeling of stupor,—I gave him twenty drops more. In ten minutes he was in a sound sleep, and continued so for over five hours. When he awoke his pupils were unaffected (not contracted). The following day I reversed the order of things. To No. 1 I gave Dr. Browne's chlorodyne; no alteration of pupil (no contraction). To No. 2 I gave Smith's chlorodyne; the contracted pupil was well marked. To No. 3, Smith's chlorodyne with atropia; the pupils were *slightly* dilated. Hence, let me ask, what does this prove and impress upon the observer? First, that chlorodyne, without belladonna, does most unmistakably contract the pupil of the eye when given in a dose sufficient to produce sleep. Second, that chlorodyne with belladonna does not contract the pupil. Thirdly, that Dr. Browne's chlorodyne does not contract the pupil *when given in a sufficient dose merely to produce sleep*.

Again, with regard to the action of belladonna upon the pupil. If to a patient be given the $\frac{1}{60}$ th of a grain of atropine, the pupil will be dilated in ten minutes. But if to this $\frac{1}{60}$ th of a grain of atropine be added the $\frac{1}{6}$ th of a grain of morphia, the pupil will

remain unaffected. In any case of poisoning by chlorodyne it was shown that the pupils were alternately contracted and dilated, the latter more so than the former, and so much so, that the iris was at times scarcely visible. As the effect of the dilating agent passed off, and the patient became comatose, the pupils became permanently contracted. This, to some extent, led me to the conclusion that morphia played the prime part in Dr. Browne's chlorodyne, its action being modified by belladonna, not the converse, as one of your correspondents suggests, belladonna modified by morphia. Again, your correspondent puts the question, Is it impossible that the joint action of morphia and hydrocyanic acid may have produced the symptoms described by Dr. Dowse? To this I cannot give an answer unless I make the experiment, but at present I have no desire to poison any one, however much it might further our views as to the composition of chlorodyne. This much, however, I can affirm most positively, that your correspondent may give ordinary doses of morphia and hydrocyanic acid for any length of time, and he will not by their conjoint action produce dilatation of the pupil. On the contrary, the pupil will be contracted until such time that the patient becomes so accustomed to its influence that it becomes inert. Again, your correspondent states, Finally, if this chlorodyne really contained any operative proportion of belladonna, I think this very decided drug would long since have proclaimed its presence there. Now, I object to this final assertion upon two points: first, that belladonna, in ordinary doses, is not the very decided drug your correspondent imagines; secondly, its action is so modified by morphia, that the usual effects are held in abeyance. And when, further on, he states, We have ascertained with positive certainty that there are present in Dr. Browne's chlorodyne only three ingredients of an active character, viz., morphia, hydrocyanic acid and chloroform; and again, when he states that Mr. Smith's formula, with the addition—may I say?—of a little caramel, will in all probability become the standard of chlorodyne throughout the British realm, I am not surprised when "Another Provincial" looks upon the language of your November correspondent as extremely tall. When he thus summarily disposes of the question, I am extremely sorry that I cannot agree with him, neither

can I understand how he arrives at such conclusion, unless it be from the analysis of Mr. Smith, which analysis, however perfect it may be, does not give us the composition of chlorodyne. And I cannot deny too emphatically the assertion of your correspondent when he says that Dr. Browne's chlorodyne is merely a disguised solution of morphia. In my former communication I stated my belief that Indian hemp did not enter into its composition. This I adhere to. I also stated that I thought it probable tobacco did so. This statement I will not retract, although I give it advisedly, as I have not noted sufficiently the physiological action of this drug. Yet, as I do not like to make a statement of this kind without a practical reason, I will suggest to your readers to test it in this way:—Place a drachm of chlorodyne in a small porcelain capsule, and expose it to the air at the ordinary temperature for twenty-four or thirty-six hours until the more volatile constituents have evaporated; then place the capsule in a sand-bath at a temperature of 140° F., when a tobacco-like odor will be emitted. By way of experiment, let him try a drachm of chlorodyne according to Mr. Smith's formula, and the result will be dissimilar. Lastly, I beg to state that the addition of belladonna to Mr. Smith's formula will give results, both therapeutical and physiological, similar to Dr. Collis Browne's chlorodyne.

In this communication I might have entered more fully into the symptoms of those patients upon whom I experimented, but I have tried to deal with the clearing up of this matter in a clear and *practical* manner. The form that I have adopted for some time past is as follows:—

R	Belladonnæ Extracti	.	.	.	3ij
	Morphiæ Muriatis	.	.	.	gr. xxx
	Ætheris Rectificat	.	.	.	f 3viiij
	Chloroformi	.	.	.	f 3viiij
	Acid. Hydrocyanic. dil.	.	.	.	f 3iv
	Olei Menthæ Piperitæ	.	.	.	gtt. xxx
	Capsicine	.	.	.	gr. vj
	Misturæ Acaciæ	.	.	.	3xx
	Caramel	.	.	.	3j
	Theriaceæ	.	.	.	ad 3lx

M. s. artem.

Whether Dr. Browne's chlorodyne contains more or less than is represented in the above formula I cannot say, neither do I attempt to assume decisively upon this point. Of course it is possible, although I deem it improbable, that it may contain some subtle ethereal compound undetected by either chemist or physiologist; and, although my formula contains belladonna,—thus differing from Mr. Smith's,—I am quite sure that the fair, impartial, and accurate clinical observer must feel assured that chlorodyne, prepared according to Mr. Smith's formula, *does contract the pupil*, thus differing from Dr. Collis Browne's; that chlorodyne, prepared according to my formula, *does not contract the pupil*, thus agreeing in its action with Dr. Collis Browne's; these observations applying only to ordinary doses.—*Pharm. Journ., Lond., June 15, 1870.*

Medical Club, May 16th, 1870.

ON FERMENTATION.

BY MR. JAMES BELL.

A series of experiments has been instituted, and is still in progress, to determine the forms of natural ferment which albumen, derived from different sources and under various conditions, will give rise to.

Albumen of eggs was introduced into a cane-sugar solution, and the mixture allowed to ferment at a temperature of 75° F. Fungoid cells, different from those of yeast, were formed, and possessed of very little fermentative power, inasmuch as only 0.2 per cent of alcohol were produced in this sample.

Albumen of flour and malt, in a cane-sugar solution, gave rise to the development of a fungoid mycelium, and consequent production of cells and spores similar to those obtained by albumen of egg. These, too, were of very little fermentative power. The albumen in this case was prepared by coagulation, and then by precipitation. When albumen of the first kind was brought into the sugar solution, the liquid very soon contained parasites, and became rapidly acid. If albumen obtained by precipitation with alcohol was employed, the solution, even after a week, was free from parasites, and also of acidity.

Cold water extracts of flour and malt were added to cane-sugar solution, which also contained some glucose. The extract, on addition of sugar-cane, was converted into mucilage; and the change is permanent in flour-extracts, but extracts of barley-meal possess great power to produce the yeast-cells, which act upon the mucilage, and resolve a portion of it into alcohol and carbonic acid. The developement of the yeast cells in the mucilage is a most interesting sight: the cells, as they multiply, are prevented from separating, on account of the thickness of the solution, and thus remain clustered together.

Cold water extracts of grain abound with microscopic parasites, which soon set up a strong action, thereby giving rise to the production of acid, and doubtless, also, to the transformation of the cane-sugar into mucilage. Boiling destroys these parasites, prevents in a great measure the production of acid, and subsequently yields more alcohol. This conclusion was arrived at after many and varied experiments.

When "pus" was employed as ferment, a fungoid organism, similar to that obtained by albumen from flour and malt, was developed in the solution, which likewise possessed very little fermentative power.

The fermentative properties of two moulds, the blue mould from moist malt, and the mould from lemon-juice, were next investigated in a glucose solution. Both proved good ferments.

In order to compare the relative fermentative power of the yeast-plants of malt and the grape, the following experiments were instituted:—

To a solution capable of giving 16 per cent. alcohol, brewers' pressed yeast was added successively. The limit was reached on the sixteenth day; but the experiment was carried on for upwards of thirty days, when the alcohol in the liquid amounted to 15.91 per cent. When the extreme point was reached, the yeast-cells became contracted and shrivelled; but, when they were transferred to a fresh sugar-solution, they recovered their vitality. In several cases, glucose was added to the cane-sugar solution: and it was here observed that, in the presence of an excess of glucose, comparatively less alcohol was obtained: the alcohol and glucose combined seemed to act as an antiseptic.

To the must from English hot-house grapes a known quantity of glucose was added, and the liquid, together with the greater part of the husks, was left to ferment at 65° F. The fermentation ceased in about twenty-three days. Another sample was permitted to ferment at 75° F.; and here all action ceased on the sixteenth day. To a third sample such amount of glucose was added as to bring the glucose naturally existing in the juice up to 40 per cent. In this case, the beginning of the fermentation was delayed much beyond the usual time; and the quantity of alcohol obtained was less than in a case where less glucose had been added.

In all cases the wine-ferment proved to be of greater fermentative power than the malt ferment.

From all these experiments Mr. Bell deduces the conclusion that it would be advantageous to add to grape-juice some glucose, so as to assist the exhaustion of the must of its fermentative element, and to impart thus to the wine a greater keeping-power. In some instances the fermentation was started in the grape-juice by brewers' yeast: the amount of alcohol here obtained was less than in the cases where the action was caused by the natural ferment of the grape-juice.

Finally, Mr. Bell instituted some experiments to ascertain the influence of change of soil; and the results in connection with the observations made in some of the above experiments lead to the inference that the various ferments have their favorite soils.

The PRESIDENT, in asking the Fellows to vote their thanks to the author, gave a brief *resumé* of the state of knowledge we at the present day possess of the yeast-plant. Though called a "plant," the yeast organism appears in all its functions rather animal than vegetable. The products of its secretion are less complicated than those it takes in. It does not, like plants, require light for its vital process; neither does it absorb heat, but, on the contrary, gives such off. Prof. Williamson then, alluding to Leibig's recent memoir, observed that this distinguished chemist has entirely dropped his ancient notions regarding fermentation, though he somewhat successfully criticised some of Pasteur's statements.—*Proceedings of Chem. Soc., in Chemical News, London, June 24, 1870.*

ON ORGANIC MATTER IN WATER.

BY DR. HEISCH.

The author was, some time ago, called on to assist a large manufacturer of lemonade, who suddenly found it impossible to make lemonade that would keep; after a day or two it became turbid, and its odor anything but agreeable. On examining the liquid under the microscope, it was found full of small spherical cells, with, in most cases, a very bright nucleus.

After investigating all the materials employed, the water was detected to bear the fault. On putting a few grains of the purest crystalline sugar into some of the water, it became turbid in a few hours, and contained the cells previously described.

On inquiry, Dr. Heisch found that some digging had been going on in the neighborhood of the well from which the water came; and that, through this circumstance, some drainage must have got into the well. This led the experimenter to try various samples of water in the same manner; and, in every case where diarrhoea or other mischief could be traced to the use of a certain water, when that water was treated with sugar, the same cells made their appearance usually within twenty-four hours, if kept at 60° to 70° , and plenty of light was admitted to the bottle containing the fermenting liquid.

Believing sewage to be the source of these cellular germs, Dr. Heisch mixed a minute quantity of sewage with a sugar-solution which had been previously ascertained to be free of cells, and found the solution very soon to contain these germs. A number of experiments were made to find out whether other substances than sewage or sewage-water were capable of producing organisms of similar kind when placed into a sugar-solution; but, though in a few cases some growths were produced, they never resembled the cells originated by sewage. In all the experiments with sewage, where the particular cells made their appearance, a butyric odor also was perceptible. Filtering the water through the finest Swedish paper does not remove the germs. Boiling for half an hour in no way destroys their vitality. Filtration through a good bed of animal charcoal seems to be the only effectual mode of removing them; but it is necessary to air the charcoal from time to time, else it loses its purifying power.

The author is at present engaged to ascertain what substances are capable of retarding or preventing the development of these germs. As to the conclusions derived from the above observations, Dr. Heisch thinks that wherever the described germs occur in water they are distinct evidence of sewage-contamination.—*Proc. Chem. Soc., in Chem. News, June 24, 1870.*

DOUBLE SULPHIDE OF POTASSIUM AND IRON.

BY PROFESSOR MORTON.

By heating an intimate mixture of 5 parts of sulphur, 5 of potassic carbonate and 1 part of fine iron filings, C. Preiss has succeeded in forming a double sulphide of potassium and iron, which crystallizes in red needles, has a metallic lustre, and resembles in appearance potassic permanganate. Its formula is $\text{KS, Fe}_2\text{S}_3$.* The same compound has been obtained independently by R. Schneider, who also has formed, by the replacement of iron by bismuth, the analogous compound, $\text{KS, Bi}_2\text{S}_3$.—*Pogg. Ann., from Chem. News, Lond., June 17, 1870.*

THE ENGLISH COMMERCIAL SODA TEST.

To the Editor of the Chemical News:

SIR,—My attention has lately been drawn to a strange error made by some analysts in attempting to apply the English commercial test for soda to samples of alkali, soda-ash, &c., the result of which error is to make the test indicate from 1 to $1\frac{1}{2}$ per cent. more soda than the sample contains by the proper English test. It is well known that this (the English soda-test) had its origin in the early days of the soda trade—when chemists believed the equivalent of soda to be 32, and that of carbonate of soda 54; and that, consequently, test acid was made so that 40 parts of sulphuric acid neutralized 54 parts of carbonate of soda, equal to 32 of soda. This method of testing has always been and still is used by the soda trade throughout England, and it is a custom well understood by both buyers and sellers. It indicates 0.66 per cent. more soda in a 50 per cent. alkali than the rigidly correct test based on the new equivalent 31 would

* Journ. f. Prakt. Chemie, cvii, p. 10.

indicate. It is certainly desirable, for the sake of scientific accuracy, that the correct equivalent, 31, should be used in testing; but, seeing that manufacturers have expended their capital in plant, and made their contracts for their various materials on the understanding that a product containing a certain percentage of soda would be obtained, and, seeing that there are other commercial customs of the trade still in force, which tell as much against the manufacturer as the test does in his favor—such, for instance, as that of not charging for fractions of percentages—it is more the province of an association like the Alkali Manufacturers' Association, than that of an analytical chemist, to make alterations in trade usages affecting such vast interests. Certainly, if any alteration be made at all by chemists, it should be made in the direction of scientific accuracy, and not in the contrary direction, as in the case to which I have referred. The error, I find, arises in this way: The test-acid is made so as to indicate the exact amount of soda according to the new and correct equivalent, 31—that is, that 40 parts of sulphuric acid should neutralize 53 parts of carbonate of soda, equal to 31 parts of soda.

To convert the results obtained by this test acid into the English commercial soda-test, it is incorrectly assumed that the 31 parts of soda are equal to 32—in other words, that the 53 parts of carbonate of soda contain 32 parts of soda. This is where the error lies; for, according to the correct English test, 54 parts of carbonate of soda, and not 53, contain 32 of soda; and, therefore, by the English test, 53 parts of carbonate of soda contain only 31.41 of soda. By thus mixing up the old and the new systems of equivalents, a sample of soda-ash which, by the correct English test, contains 50.66 per cent. would be returned as containing 51.61 per cent. of soda. A sample of caustic soda which, by the correct English test, would contain 75.0 per cent. of soda would, by this erroneous method, indicate 76.4 per cent. It is only necessary to point out this error in order that it may be avoided and guarded against by any of your readers interested in the buying and selling of alkalis.

I am, &c.,

JOHN PATTINSON.

Newcastle-upon-Tyne, June 7th, 1870.

—*Chem. News, Lond., June 17, 1870.*

ASHY CROWN CINCHONA IN VENEZUELA.

Dr. Ernst, the President of the Society of Natural and Physical Sciences of Caracas, has rediscovered the *Cinchona cordifolia*, Mutis, var. *rotundifolia*, Weddell (*C. rotundifolia*, Pavon), in the neighborhood of Caracas, a specimen having been collected in 1829 by Dr. Vargas in the same place.

In an excursion made by Dr. Ernst, the trees were found in groups on the slopes of Papelon, Anauco, Galipan, etc., at an elevation of 4500 feet above the sea-level. The trees were covered with lichens (the *Graphis sulcata*, DC., being particularly noticed), and the largest of them had a circumference of 83 centimetres. The same tree is said probably to occur in Mariches, from whence small quantities of bark were collected for exportation some time ago. The bark of this tree is known in commerce as Ashy Crown Bark, one of the Loxa or Crown Barks, and occurs in quills. From an analysis made by Senor Vicente Marcano, a member of the same society, 60 grammes of this bark yielded 3 decigrammes of quinine, and 4 decigrammes of cinchonine. The bark, however, was collected at the wrong season.

From Port Cabello another bark, known as Quina Maracaibo, is exported. This is the produce of the *Cinchona Tucujensis*, a tree growing only to the height of 12 to 15 feet, which is found in the forests surrounding the colony of Tovar. In the same forests are found *Cinchona* (now *Buena*) *Henleana* and *Moritziana* of Klotzsch.—*Vargasia: Boletin de la Sociedad de Ciencias Físicas y Naturales de Caracas*, No. 7, 1870, from *Pharm. Jour.*, Lond., July 23, 1870.

TETRABROMIDE OF CARBON.

At a recent meeting of the Chemical Society, the discovery of the tetrabromide of carbon was announced by Messrs. Bolas and C. E. Groves. This compound is obtained by several processes: (1) by heating bisulphide of carbon in a sealed tube with bromide of iodine; (2) by digesting bromopierin (CB_3NO_2) with bromide of iodine in a flask furnished with a condensing

tube; (3) by heating bromoform (CHBr_3) with bromide of iodine in a sealed tube. The product is obtained in a pure state by distillation. It is a white substance, crystallizing in plates, melting at 91°C ., of an ethereal odor, somewhat resembling that of tetrachloride of carbon, and sweetish taste. It is not soluble in water, but dissolves in ether, alcohol, bisulphide of carbon, chloroform, bromoform, benzol, and American oil. Sodium amalgam reduces it to bromoform, and then into dibromide of methylene.

This interesting body belongs to the group which has yielded nearly all our anæsthetics, and it will be seen, on inspecting the tabulated arrangement below, that there is now but one member missing, to be supplied, we may safely hope, by future research. The tetriodide of carbon is the body which yet remains to be found to complete the series.

	Chloride.	Bromide.	Iodide.
Methyl . .	CH_3Cl	CH_3Br	CH_3I
	Dichloride.	Dibromide.	Diniodide.
Methylene . .	CH_2Cl	CH_2Br_2	CH_2I_2
	Trichloride.	Tribromide.	Tri-iodide.
Formyl . .	CHCl_3	CHBr_3	CHI_3
	(Chloroform.)	(Bromoform.)	(Iodoform.)
	Tetrachloride.	Tetrabromide.	Tetriodide.
Carbon . .	CCl_4	CBr_4	CI_4
			(Missing.)

—*Lond. Pharm. Journ.*, June 15, 1870.

LIME JUICE.

A superior quality of lime juice has been lately imported into this country by Messrs. Evans, Lescher & Evans, which is prepared on the plantation of Sturge's Montserrat Company. This juice seems to keep clear and bright without any addition of spirit or any chemical agent, and it is of very excellent flavor. We have learned the following interesting particulars of the island of Montserrat, and of the cultivation of the lime tree there, from the consignees: [Geographical notice omitted.]

The lime tree, a native of Western Africa, seems early to

have found a congenial *habitat* in Montserrat. In the autobiography of a negro, who obtained his freedom about the year 1750, he mentions his first profitable adventure, as consisting in trading in this fruit to the neighboring islands. The tree, however, has never been made an object of extended and systematic cultivation till within the last twenty years. Its form is that of a large Lauristina bush, spreading in some instances over the ground for twenty to thirty feet; its foliage is like that of the myrtle, but with leaves of brighter green. It is armed with sharp thorns, making it often difficult to gather the fruit from the interior of the tree. The blossom is smaller than that of the orange, with a powerful fragrance. The crop is principally gathered in the months commencing with July and ending with February, the trees often displaying at the same time the blossom and the ripe limes, with the green fruit in all its intermediate stages of growth.

The plantations range along the shore for about two miles, extending in one direction to about 1500 feet up the mountain steeps, with space between the trees to admit of the pasturage of cattle among them.

During the season of crop, the fields are traversed by a large company of young negroes, with a woman superintending them, who gather the ripe fruit into wide open baskets. When these are all filled, they are taken direct to the presses at the boiling houses, and the large company of "little people," as they are termed, proceeding with quick step in long Indian file, with the bright yellow fruit on their heads contrasting with their dusky figures, now lost among the lime trees, now emerging into the open path, presents to the stranger a curious and novel spectacle unique in its kind.

So the fruit, on its reaching the works, is passed through a machine driven by the mountain stream, which cuts it into slices, when it is transferred to the presses for the expression of the juice, which is then evaporated to about the consistency of honey for the manufacture of citric acid.

When, however, it has to be shipped as fresh juice, the fruit is first carefully sorted, and the unripe or over-ripe limes rejected, and when transferred to the presses, only about two-

thirds of the juice is pressed out for this purpose; it being found that the last portion resulting from extreme pressure is of diminished strength and quality. This purer juice, being run from the presses at once into casks, is immediately secured from the air, so as not to be opened till its arrival in England.

The lime tree requires a period of from seven to ten years from the time it is planted before it makes any considerable return in fruit.

Montserrat, like the adjoining islands, is occasionally visited by earthquakes. In that of 1843, occurring in dry weather, the large quantity of rocks and boulders detached from the mountain summits enveloped them in such an atmosphere of dust, that the captain of the inter-colonial mail steamer, passing at the time, reported that the island had, in the convulsion, sunk under the ocean.—*Chem. and Drug., Lond., June 15, 1870.*

SNAKE POISON AND ITS ANTIDOTE.

The following communication appears in a recent issue of the *European Mail*, and throws an important new light on the therapeutics of animal poisons:

SIR,—Having noticed of late the publication in both European and American journals of articles upon the subject, and particularly one under date March 2, 1870, under the heading, “The Cobra Question in India,” I trust you will give publicity to this communication, on account of its importance; and am induced to ask for it a place in the columns of your journal, in the hope that it will afford to your readers, in India more particularly, a knowledge of an antidote for snake poisons, which may claim to be specific, insomuch as it has never been known to fail in a single instance during the past three years in different districts in this country, in which I have been able to induce its general adoption, and particularly by the *curanderos*, or curers (snake charmers). I have devoted no little time during the past twenty years to a study of the habits, peculiarities, &c., of poisonous snakes, and have made many experiments with their poisons, with a view to discover, if possible, specific antidotes to them, and have been so far successful as to be able to announce the

law in therapeutics that "all animal poisons have their specific antidotes in the gall of the animal or reptile in which these poisons exist."

The bite of the *cobra*, or of any other poisonous snake or reptile, can be cured by administering a few drops of a preparation of the gall of the *cobra*, which should be prepared as follows: Pure spirits of wine, or 95 per cent. alcohol, or the best high wines that can be procured, 200 drops; of the pure gall, 20 drops; in a clean two-ounce phial, corked with a new cork; give the phial 150 or 200 shakes, so that the gall may be thoroughly mixed with the spirits, and the preparation is ready for use. In case of a bite put five drops (no more) of the preparation into half a tumblerful of pure water; pour the water from one tumbler into another, backwards and forwards several times, that the preparation may be thoroughly mixed with the water, and administer a large tablespoonful of the mixture every three or five minutes until the whole has been given. In case the violence of the pain and hæmorrhage or swelling of the bitten part should be but slightly alleviated after the whole has been taken, repeat the dose, prepared with the same quantity of the preparation in the same way, and administer as before. In curing upwards of fifty cases of snake bites I have never been obliged to repeat the dose except in two instances, and have never lost a case. The *cobra* poison is no more deadly than that of a great variety of snakes found in South America, of which may be named the *Cascabel*, or *Rattlesnake*; *Boqui-dorada*, or gilded mouth; *Mapana-sapo*, or frog-headed Mapana; *Mapana-fina*, or *Lachesis*, *Niger*, *Birri*, and *Verrugosa*, or wart snake. The poison of all these varieties produces death (under certain conditions—atmospherical, physical, climaterical, and electrical) in from fifteen minutes to two or three hours; but it is found that the gall of each variety (administered as previously indicated) is the perfect antidote for its own poison. The gall of the most deadly kind may be used in cases of bites of those less virulent, and is also applicable in cases of bites of the centipede, scorpion, stingray, star-lizard, or *Lacerta stella*, and is also very effective in dog-bites. The native curers use a tincture of a plant called *Alconcito*, or *solobasta*, for bites of the *Cascabel* and *Boqui-dorada*,

with very good success in cases of bites, and also as a prophylactic, by inoculation (in the point of the shoulder), for preserving themselves harmless against these poisons. For this purpose incisions are made at the lower point of attachment of the deltoid muscles, in the same manner as for vaccination, and into these are introduced small pellets of cotton (of the size of a millet seed) saturated with an alcoholic tincture of the *Alconcito*. Care is taken to keep within doors and out of the wet and dew for from fifteen to twenty days, after which period the inoculation is concluded. Of the efficacy of this process, I can say that I have repeatedly tested it on dogs, in a district where every dog not inoculated, if bitten by a snake, invariably dies, and have never known an inoculated dog to show any inconvenience from the bite of the most venomous viper. This plant is the *Aristolochia Colombiana*. In Brazil the curers use the tincture of the *Aristolochia millhomeus*, or *Arist. grandifloras*. In the United States the Indians use the *Serpentaria*, or *Aristolochia Virginiana*, and it is more than probable that the *Arist. Colo.*, or the *grandifloras*, is to be found in India.

During my research in this branch of natural history I have collected much interesting and valuable information, all of which I have incorporated in a small work that will shortly be published in English; but the reports of such a frightful number of deaths from snake bites as English journals record as having occurred during the past year in certain parts of India, have led me to address this letter to you, that the truth of the efficacy of this antidote for snake bites may be tested by every person who takes any interest in the matter, and that these tests may be so effectually made that a point of such vital importance as the discovery of the specific antidote for these poisons may be known throughout the world.

I indulge the hope that I may see repeated corroborations of the results of my own humble labors in this specialty through so many years.

Your obedient servant,

S. B. HIGGINS.

State of Magdalena, April 10, 1870.

—Chem. & Drug., Lond., June 15, 1870.

CHLORAL.

By C. A. MARTIUS AND P. MENDELSSOHN-BARTHOLDY.

In the course of our experiments on the preparation of hydrate of chloral, it fell in our way to examine different preparations found in commerce, the purity of which was guaranteed by crystallization from sulphuret of carbon and ether, and subsequent pressing out. Our attention was also directed to the varying statements respecting the points of fusion and ebullition of hydrate of chloral, and to the possibility of admixture of foreign substances, even after the renewal of free chlorine and hydrochloric acid, and notwithstanding its solubility and apparent homogeneity; and that to these foreign substances might be due the discrepancies relative to physical properties, and possibly also the physiological discrepancies found by different observers. We were especially struck by the differences in boiling-point in different preparations, and led to the preparation of a series of compounds which threw light upon these discrepancies, and which are, moreover, of some scientific interest.

It had been observed by J. Personne* that chloral enters into combination with alcohol just as it does with water. According to our observations, the other alcohols of the fatty series behave similarly to ethylic alcohol. When one equivalent of chloral is mixed with one equivalent of anhydrous ethylic alcohol, there is union accompanied with development of heat, and, on cooling, the resulting compound solidifies into a crystalline mass. The same takes place when methylic, butylic, or amylic alcohol, or mercaptan, is substituted for ethylic alcohol.

We may regard these compounds as intermediate trichloroacetals.

Acetal.	Trichloroacetal.	Chloral-hydrate.
$\text{CH} \begin{Bmatrix} \text{CH}_3 \\ \text{OC}_2\text{H}_5 \\ \text{OC}_2\text{H}_5 \end{Bmatrix}$	$\text{CH} \begin{Bmatrix} \text{CCl}_3 \\ \text{OC}_2\text{H}_5 \\ \text{OC}_2\text{H}_5 \end{Bmatrix}$	$\text{CH} \begin{Bmatrix} \text{CCl}_3 \\ \text{OH} \\ \text{OH} \end{Bmatrix}$
Chloral alcoholate.	Chloral amylate.	Chloral mercaptide.
$\text{CH} \begin{Bmatrix} \text{CCl}_3 \\ \text{OH} \\ \text{OC}_2\text{H}_5 \end{Bmatrix}$	$\text{CH} \begin{Bmatrix} \text{CCl}_3 \\ \text{OH} \\ \text{OC}_5\text{H}_{11} \end{Bmatrix}$	$\text{CH} \begin{Bmatrix} \text{CCl}_3 \\ \text{SH} \\ \text{OC}_2\text{H}_5 \end{Bmatrix}$

* "Comptes Rendus," vol. lxi, p. 1363.

Inasmuch as the production of these compounds takes place without formation of any bye-products, analysis of them appeared to be unnecessary. We have, however, taken the vapor-densities of some of them, and found that, like chloral-hydrate itself, they have only half the condensation indicated by their formulæ.

With the *ethers* of the alcohol-radicals chloral does not combine. The compound of chloral and ethylic alcohol, boils at 115° to 116° C., and solidifies at 40° C., becoming crystalline. At 40° C. (in the fluid condition) its sp. gr. is 1.143.

In cold water it dissolves only slowly, but on warming, the solution is complete. In ether, alcohol, acetic ether, and petroleum, it is easily soluble; and on cooling the hot concentrated solution, it crystallizes out in long beautiful needles.

The methylic compound resembles the ethylic compound very closely. It boils at 98° C.

The amylic compound boils at 143° C., and at 25° C. has a sp. gr. of 1.2340. At 25° C. it solidifies to a crystalline mass, which is soluble in ether, alcohol, and petroleum. From the last-named solvent it is capable of crystallizing in long tufts of needles. Only on prolonged boiling with water is the decomposition into chloral and amylic alcohol complete.

Chloral-mercaptide, chloral, and mercaptan combine with great evolution of heat, and form a crystalline compound, soluble in ether, alcohol, sulphuret of carbon, and capable of crystallizing easily out of its solutions in these solvents.

We can easily understand that the alcohol-compound has been often taken for the hydrate of chloral, and that the hydrate has been often contaminated with the alcoholate.

It appears to us to be especially interesting to study the physiological characters of the alcohol-compounds; according to O. Liebreich, the physiological effects of the alcoholate differ essentially from those of hydrate. In preparing the hydrate for medicinal use, one of the main points to be attended to is its freedom from alcoholic compounds. Pure hydrate of chloral boils at 95° C., as we have ascertained by numerous experiments.—*Pharm. Journ.*, July 30, 1870, from Buchner's "*Reperatorium für Pharmacie*," 1870.

CHEMICAL EXAMINATION OF SEVERAL SORTS OF CONDENSED MILK.

BY L. KOFLER.

The following samples, examined by the author, were exhibited at the Agricultural Show at Schwarzach:—

I. From the Anglo-Swiss Condensed Milk Company, in Cham, Canton Zug; in air-tight tin boxes containing one pound.

II. From the manufactory at Sassin; in square glasses.

III. From the German-Swiss Milk Extract Company, at Vivis and Kempten; in glass vessels.

IV. The same; in tin boxes.

For the purpose of comparison, a similar preparation was made with milk that had been examined during twelve days previously, with the following results:—

					Specific gravity.	Amount of Cream.
15	October	.	.	.	1.034	13
16	"	.	.	.	1.036	13½
17	"	.	.	.	1.040	14
18	"	.	.	.	1.034	13
19	"	.	.	.	1.034	13½
20	"	.	.	.	1.034	13
21	"	.	.	.	1.035	12
22	"	.	.	.	1.033	12
23	"	.	.	.	1.034	13½
24	"	.	.	.	1.036	12
25	"	.	.	.	1.035	15
26	"	.	.	.	1.033	15
Mean results					1.035	13.1

This preparation was marked V., and underwent the same examination as the other samples.

Determination of Water.—By drying until the weight remained constant.

Determination of Fat was made by extraction with ether, until the residue examined under the microscope presented no fat globules.

Determination of Casein and Albuminous Material was made by slightly acidifying with acetic acid at a gentle heat, filtering, and drying.

Determination of Salts by incineration. The further examination of the ash showed that it contained, like the ash of pure cow's milk, upwards of 40 per cent. of phosphates, and that one-half consisted of potash, soda, lime, and sulphates.

The amount of sugar in the samples varied between 25 and 30 per cent.; the amount of milk sugar, between 14 and 18 per cent.

The following table gives the general results:—

Constituents.	I. Cham.	II. Sassin.	III. Kempton.	IV. Kempton.	V. Standard.
Water . . .	22.180	18.824	22.421	18.810	20.770
Fat . . .	12.260	12.625	12.030	13.650	12.830
Caseine and Albumen }	28.100	24.240	25.960	24.900	29.600
Ash . . .	2.180	2.482	2.673	2.430	2.865

All of these samples, dissolved in four or five times the volume of water, furnished milk which in appearance and taste perfectly resembled fresh boiled milk, except that it was sweet, owing to the admixture of sugar.—*Pharm. Journ.*, July 30, 1870, from *Vierteljahresschrift für Praktische Pharmacie*.

A SIMPLE, CHEAP AND EFFICIENT SUBSTITUTE FOR THE STOMACH PUMP.

By JOHN T. HODGEN, M.D.,
Professor of Anatomy, Saint Louis Medical College.

About a year ago, I had a case of stricture of the œsophagus so narrow that my patient could not swallow even liquids. To sustain life I resorted to a small stomach tube (a gum catheter, in fact), as a means of injecting liquid nourishment; to this I fixed the elastic tube of one of Davidson's syringes.

On one occasion the vessel containing the liquid happened

to be higher than the patient's stomach, and I observed while the syringe was not being used, that the liquid continued to flow into the stomach—the action being that of a syphon. I at once, to test the syphon, substituted a simple elastic tube for the syringe, and found the stomach could be as readily emptied as filled. Thus I conceived the idea of using a syphon instead of a stomach pump, and have used the same in a case of poisoning recently with the most complete success.

I attach four feet of india rubber tubing to a stomach tube, fill both with water by simply dipping it in the liquid end first, then compressing the elastic tube between the thumb and finger to keep the fluid from running out, introduce the stomach tube, lower the outer end of the elastic tube, and the contents of the stomach pour out as readily as if from an open vessel. When the fluid ceases to flow, I dip the outer end of the tube beneath the surface of water, elevate the vessel containing it, and the stomach is soon filled; lower again the outer end of the tube and the stomach is emptied. This can, of course, be repeated as often as is necessary.

The advantages claimed for this simple contrivance are, that it may be almost always improvised, is of speedy and easy application, has no valves to become obstructed or deranged, and is less expensive than a stomach pump.

The same principle may be applied in injecting fluids into the bowels, as indeed it has been for injecting into the bladder, uterus and vagina.—*Bost. Med. and Surg. Journ.*, August 11, 1870, *from St. Louis Med. and Surg. Journ.*

PALM OILS OF COMMERCE.

By P. GUYOT.

Palm oil is obtained from the fruit of the *Avoira* or *Croco* palm-tree, growing on the coast, and also in the interior of Guinea. It yields two kinds of oil—viz., a white-colored, butter-like substance, extracted from the kernel of the fruit, and chiefly used by the natives as food; the point of fusion of this oil is stated to be rather high. The other kind is extracted from the fibrous sarcocarpon surrounding the fruit; at the prevailing

temperature of its native country, this oil is fluid, but in Europe it has the consistency of butter; its color is yellowish orange, and its smell is very much like that of violet flowers; it is insoluble in cold as well as boiling water, slightly soluble in alcohol, and very soluble in ether. The author gives, in a tabulated form, the results of the action of different reagents upon the oil alluded to, and some of the commercial varieties thereof, as imported from other countries where the oil is obtained either from the same or some other kind of palm-tree. The action of the reagents alluded to (sulphuric and nitric acids, ammonia, chloride of zinc, protochloride of tin, pernitrate of mercury, and liver of sulphur) is not sufficiently characteristic to be specifically quoted here; and this is the less necessary because, as the author also states, adulteration of these oils would not be practised in the country whence they are exported, and certainly not in Europe, unless it were done in a very wholesale manner, and with the application of very inferior fats. The complete solubility in ether is a sufficient test of purity; the coloring matter is readily destroyed when desired.—*Chem. News*, June 24, 1870, from *Mon. Sci.*

ON CYCLOPIC ACID, A NEW FLUORESCENT SUBSTANCE
EXTRACTED FROM THE *CYCLOPIA VOGELII*.*

BY ARTHUR H. CHURCH, M. A. Oxon, F. C. S.

One of the plants used by the African Boers, for tea, is the *Cyclopia Vogelii*. Endeavoring to extract theine from the dried leaves and flowers of this plant, I met with a substance apparently new to science, and possessing one remarkable property, that of a high degree of fluorescence. This character is best seen when a crystal or two of the new body is dropped into a solution of caustic soda and viewed in sunlight. An intense greenish yellow fluorescence is perceived at first, but disappears in the course of some hours.

I have named the new substance *cyclopic acid*. It is extracted by enclosing a pound or so of the dried leaves in a cloth, and immersing this for some days in water at about 30°—40° C., occasionally squeezing the cloth. A yellow powder gradually

* Communicated by the Author. From the Report of the Chemical Department, Royal Agricultural College, Cirencester.

accumulates at the bottom of the vessel of water, and should be dissolved in a mixture of ether, alcohol, and water, acidified with a drop of acetic acid. By two or three re-crystallizations from weak alcohol, the cyclopic acid is obtained pure. It contains only carbon, hydrogen, and oxygen; different samples gave closely accordant results on analysis:

	Percentages of Carbon.				Percentages of Hydrogen.			
1.	53.43	.	.	.	.	.	.	5.78
2.	53.58	.	.	.	.	.	.	5.92
3.	53.40	.	.	.	.	.	.	5.13
4.	53.36	.	.	.	.	.	.	5.62

These numbers correspond pretty fairly with the formula $C_7H_8O_4$, which demands the following percentages:

Carbon,	.	.	.	.	53.84
Hydrogen,	.	.	.	.	5.13
Oxygen,	.	.	.	.	41.03
					100.00

The formula, $C_7H_8O_4$, is rendered more probable by the result of neutralizing cyclopic acid with a standard solution of ammonia. The formula indicated for the ammonium cyclopate thus produced was $C_7H_6[NH_4]_2O_4$.

It is possible, however, that cyclopic acid contains more hydrogen than assumed above, in which case it would have the formula $C_{14}H_{18}O_8$, and its ammonium salt be $C_{14}H_{14}[NH_4]_4O_8$.—*Chem. News, Lond., July 1, 1870.*

EFFECT OF BISULPHIDE OF CARBON ON WOOD.

Bisulphide of carbon, according to Sidot, renders wood very sonorous, and makes it an excellent conductor of heat and electricity. Sidot passed vapors of bisulphide of carbon over pieces of wood in a porcelain tube, first in the cold, in order to expel the air, and then at high temperature, the tube being slowly and gradually heated for an hour until it was red-hot. The various kinds of wood yield, by this treatment, a coal which is not surpassed by the most sonorous substances known. Sidot made a bell of oak wood, and subjected it to this treatment with bisulphide of carbon. The sound it gave after the process compared

favorably with that of a metallic bell of equal diameter. The hardest kinds of wood seem to produce the purest and most harmonious tones. On account of its capacity of conducting heat and electricity, Sidot recommends the coal prepared in this manner for use in Bunsen's galvanic batteries, and for pencils for the electric light. Such pencils give a much intenser light than those made from the graphite of gas retorts; they become gradually white-hot throughout their whole mass, without burning at a single point, and cool down immediately as soon as the fire is removed. Linen, hemp, cotton, paper, and silk behave similarly to wood, and the action of methylated spirits (wood naphtha), hydrocarbons, &c., resembles that of bisulphide of carbon. The coal from wood has superficial metallic lustre, is denser than common charcoal, and has a greater absorbing power for gases. —*Pharm. Jour., Lond., July 2, 1870, from Journal of Society of Arts.*

CULTURE AND DISEASES OF THE SILKWORM.

Pasteur has recently investigated some of the diseases which attack the silkworm, and has published the results of his labors in a work entitled "Sur la Maladie des Vers à Soie." The disease, called pébrine, which has been very prevalent and destructive of late years in various parts of France, has especially engaged his attention.

Pébrine derives its name from the black specks which occur on the silkworm suffering from it, and it consists in the development of peculiar parasitic corpuscles which invade the eggs, the blood, and all the tissues of the silkworm. One of the observations of M. Pasteur is, that the corpuscles are very easy of detection in the moth of the silkworm, whilst in the earlier stages of silkworm development, *i. e.* in the stage of the egg and of the worm, the detection of the pébrine corpuscles is difficult and often impossible.

Moths which are recognized as sound, produce sound eggs, whilst unsound moths produce unsound eggs, which, although themselves showing no sign of the disease, cannot develop into healthy worms.

Pasteur's practical advice to the silk cultivator was to examine the moth, and to make sure that healthy moths were started

from. The mode of procedure in vogue before Pasteur's investigation of the subject was to examine the eggs. Pasteur remarks, that the culture of the silkworm ought to become a profitable industry in many of the colonies of Great Britain.—*Pharm. Journ., Lond., July 16, 1870.*

NEW METHOD OF HEATING STONEWARE VESSELS, AND OF OBTAINING REGULATED HIGH TEMPERATURES.

In conducting chemical and pharmaceutical operations for manufacturing purposes, it is generally necessary to effect evaporation and distillation in stoneware vessels; but great difficulty has been hitherto experienced in obtaining a sufficiently high temperature without cracking or breaking the pan employed. The use of a naked fire inevitably causes a fracture; and a sand bath offers too great an obstruction to the passage of the heat. With a steam-jacket, it is impossible even to raise water to the boiling point, unless, indeed, such a pressure of steam be applied as to cause a very dangerous strain on the flanges of the vessel.

A new method of applying heat, however, has been patented by Mr. J. A. Coffey, the pharmaceutical engineer, and is now introduced by Messrs. Doulton & Watts, for working stoneware pans and stills, by which any temperature ranging from 100° to 700° F. can be safely and easily obtained.

Mr. Coffey's principle is to cause heavy paraffin oil to circulate, first through a coil of pipes in a furnace, and then through the jackets of the pans. The oil is carefully selected for the purpose, from the heaviest of the petroleum or paraffin products. It moves by its own convection. Heated in a close coil of pipe by a coke fire, it rises into an air-tight tank, from which it passes, through pipes, to the jackets of the different vessels to be heated, returning, after it has done its work, to the lowest part of the furnace coil; a continuous circulation is thus maintained, similar to that which occurs in a hot-water apparatus for warming buildings. After leaving the tank, the oil passes through a pyrometer, by which its temperature is indicated, and, by means of dampers, &c., to the fire, this can be regulated to any required point. The heating medium is turned on or off the jackets by taps, in the same manner as steam; and, as the

rate of flow can be checked or augmented at will, the temperature is perfectly under the control of the operator.

In the model which has been fitted up at Messrs. Doulton & Watts' to illustrate the principle of this method of working, the pyrometer generally indicates from 600° to 700° F., while a saturated solution of chloride of calcium is maintained at the boiling point in a shallow stoneware pan. No smell of oil is perceptible in the room; and it is stated that the same oil may be used for years, without deterioration or causing any deposit in the pipes. As contrasted with steam heat, the inventor claims for his process a saving of 30 per cent. in fuel. It is obvious that the large amount of heat necessary to convert water at 212° F. into steam at 212° is hereby economized. The stoneware used in this process is manufactured expressly by Messrs. Doulton, to ensure its being quite impervious to the oil.

Other applications of this method of conveying heat are included in Mr. Coffey's patent; but its easy adaptation to heating stoneware will probably be of the most interest to chemists.—*Chem. News*, June 10, 1870.

MODE OF PREPARING THE CUTCH OF COMMERCE FROM THE ACACIA CATECHU.

BY CLAUDE DUMAINE.

Of this tree there are two varieties,—a white and a red kind; but the cutch or catechu is almost always prepared from the red kind, the white being seldom cut down. Cutch, or catechu, is prepared thus: The tree is cut down to about 6 to 12 inches from the ground, and chopped into small pieces, the smaller branches and bark being rejected. The chopped wood is then taken to the place of manufacture, generally under trees in the open air, and placed over a brisk fire in mud jars, called *gharrahs*, filled with about two-thirds of water. This is allowed to boil down till, with the extracted matter, it forms a liquid of syrupy consistence. The contents of several jars are then poured into a larger jar and again placed over a brisk fire for a period of from two to four hours, and, when sufficiently boiled down, it is poured out over mats covered with ashes of cow dung and allowed to dry. The wood, when dry, is used for fuel.—*Journ. of Agr. and Hortic. Soc. of India*, pt. iv, p. 399, 1869, from *Pharm. Journ.* July 9, 1870.

EUCALYPTUS OIL.

The essential oil of eucalyptus now being introduced into use in perfumery by Mr. Rimmel, has lately been examined by Cloetz. He took the product of *Eucalyptus globulus*, originally a native of Tasmania, where it was discovered by Labillardière, in the year 1792. It has since been acclimatized on the shores of the Mediterranean. From 10 kilogrammes of fresh leaves of the plant, 275 grammes of the essential oil were obtained by distillation with water. In another experiment about double the quantity of oil was obtained. The oil is very fluid, almost devoid of color, and having a smell analogous to that of camphor. It begins to boil at 170° C., and rises in boiling point as the distillation proceeds, until above 200° . The more volatile liquid, after purification with caustic potash and with fused chloride of calcium, boils regularly at 175° C.; this is eucalyptol. Its specific gravity at 8° C. is 0.905; it deflects the ray of polarized light to the right; it does not freeze; its vapor, mixed with air, is fresh, agreeable when inhaled, and has been employed as a therapeutic agent; it is hardly soluble in water, but very soluble in alcohol; its alcoholic solution, when highly diluted, is said to afford a perfume equal to the rose. The composition of eucalyptol is represented by the formula $C_{12}H_{20}O$ (vapor density 6.22). By the action of anhydrous phosphoric acid upon it, a liquid hydrocarbon of the formula $C_{12}H_{18}$, and named eucalyptene, has been obtained. This liquid boils regularly at 165° C., and has a sp. gr. of 0.835 at 12° C. Its vapor density is 5.3. It is derived from eucalyptol by the loss of the elements of water. At the same time a polymer of eucalyptene is produced. This liquid boils at temperatures above 300° C. Decomposition of the substance at the high temperature required for the determination of its vapor density, prevented a determination of that important datum. The name eucalyptolene is proposed for it. The behaviour of eucalyptol towards hydrochloric acid gas is very interesting. Cooled to zero and then treated with a current of dry hydrochloric acid gas, it absorbs the gas abundantly and solidifies to form a mass of crystals. Very soon, however, these crystals undergo spontaneous

decomposition, and are resolved into an aqueous solution of hydrochloric acid and a hydrocarbon, boiling about 168° C., and apparently identical with eucalyptene. In chemical history, therefore, eucalyptol resembles camphor, of which it appears to be a homologue—two steps higher in the series.—*Pharm. Jour. London, July 23, 1870, from Repertoire de Pharmacie.*

ON CURCUMIN.

M. Iwanof Gajewsky, has investigated turmeric, and states that sulphide of carbon takes up from that drug an oil containing, besides oxygen, 80.2 per cent. of carbon and 10 per cent. of hydrogen. This oil boils at from 240° — 260° C. The drug having been next treated with ether, yields to that solvent curcumin, as a yellow-colored crystalline body C_4H_4O , fusing at 172° ; the drug contains, moreover, another pigment and an alkaloid.—*Chemical News, Aug. 12, from Berich. der Deuts. Chem. Gesell., Berlin.*

ACTION OF CHLORINE UPON ABSOLUTE ALCOHOL WHILE EXPOSED TO DIRECT SUNLIGHT.

BY MM. STREIT AND FRANZ.

While engaged in making hydrate of chloral with absolute alcohol, direct sunlight accidentally fell upon the apparatus, the temperature of the contents of which was 62° . The continued action of the sun's rays caused a series of sharp detonations, accompanied by very bright lightning-like flashes inside the apparatus; the fluid, previously quite clear, became black, a blackish powder was separated, and the temperature rose to 78° . The authors repeated the experiment with artificial light, and found that magnesium light, the light emitted by a mixture of sulphide of carbon and deutoxide of nitrogen while burning, electric light and the light emitted by the ignition of a mixture of chlorate of potassa and sulphur, when ignited produce the same effect. The products of the decomposition of the alcohol were not further investigated, but exhibited a most frightful stench and a deep reddish brown color.—*Chemical News, London, Feb. 25th, 1870.*

Varities.

On the Preparation of Subacetate of Lead by the Cold Process. By M. NERNING. When this preparation is made with heat, the acetate of lead is liable to dissolve excess of oxide of lead, and insoluble basic acetate is thus produced, forming a white flocculent precipitate, which renders the liquid turbid. To obviate this inconvenience, M. Nerning proposes to operate as follows:—Put the water, litharge, and acetate of lead into a bottle, and let them stand, with frequent agitation, for twenty-four hours, then filter. The solution thus obtained answers all the purposes for which it is required in pharmacy, and, if kept in a well-stoppered bottle, it will remain clear even when kept for a long time.—*Pharm. Journ.*, July 9, 1870, from *Journal de Pharmacie et de Chimie* *

The Riga Pine.—M. Keller, of Darmstadt, writing in 'Cosmos,' says, that what is known outside Russia as the Riga Pine, [yielding Riga Balsam] and which has been praised for its specially good qualities, is unknown by any distinctive appellation at Riga, and is, in fact, nothing more than the ordinary *Pinus sylvestris*.—*Pharm. Journ.*, July 9, 1870, from *Athenæum*.

Conversion of Angelic into Valerianic Acid.—According to Jaffe, angelic acid is not converted into valerianic acid by means of hydriodic acid. According to Ascher, a temperature of 180° to 200° C. is needed for this transformation, which does not take place at low temperatures. By heating together angelic acid, red phosphorus, and hydriodic acid to 180° to 200° C., for the space of eight hours, a complete transformation into valerianic acid was effected. As our readers will know, angelic acid differs from valerianic acid by two equivalents of hydrogen, which, according to the foregoing account, it acquires from the hydriodic acid.—*Pharm. Journ.*, August 6, 1870.

Hybridization of Cinchonæ.—At the March meeting of the Linnean Society an interesting paper, by Mr. Broughton, chemist to the Madras Government, was communicated by Mr. Howard. Mr. Broughton stated that in the Madras gardens young plants were growing which appeared to be hybrids between *C. succirubra* and *C. officinalis*. In Java also something similar has occurred between *C. Calisaya* and *C. Pahudiana* (= *C. Hasskarliana*, nov. sp. Miq.). In a letter, Dr. de Vrij says:—"The Ca-

*The editor, in a note, states with reference to this process, that it has long been adopted in the military hospitals, the following being the proportions of ingredients used:—Crystallized acetate of lead three hundred parts; litharge, in fine powder, a hundred parts; distilled water, six hundred and fifty parts. Put them into a bottle, shake them from time to time, and at the expiration of six or eight hours, filter.

Usaya of Java contains, besides quinine and cinchonine, very often quinidine. The *C. Pahudiana* contains, besides quinine and cinchonine, almost always cinchonidine. In the hybrid of these two I found no quinidine, but cinchonidine and quinine. As the total amount of alkaloids was small, I was unable to ascertain the presence of cinchonine." (The Hague, 1870.) This discovery will doubtless prove of great importance, for by this means the more delicate, but valuable, alkaloid species can be crossed with those that are more hardy but less valuable, and thus valuable and hardy plants will be obtained.—*Pharm. Journ.*, Aug. 6, 1870.

Tea culture in Tennessee.—The tea plant is in successful cultivation some ten miles from Knoxville, Tenn., where it has been raised for the past ten years. The plants were originally obtained through the Agricultural Department at Washington, in the year 1858.

The plant is an evergreen shrub, growing to the height of some five feet. It is perfectly hardy, and needs no protection from frosts. It bears an abundant crop, with beautiful, fragrant flowers, in October. The seed is not matured until the following season.

Captain James Campbell, who has made the experiment of raising the plant, has not attempted its cultivation on a large scale, but, as he expresses it, "just enough to keep the family in tea." Good judges, who have tried the Captain's tea, pronounce it to be not inferior in fragrance and flavor to the imported Young Hyson. It seems quite probable, then, that "Young America" may yet live to see Young Hyson thoroughly naturalized on Uncle Samuel's plantation.—*Nashville Journ. of Med. and Sur.*, Feb., 1870, from *Boston Journ. of Chem.*

Nitrite of Amyl.—Guthrie, who investigated the properties of the nitrite of amyl after the discovery of it by Balard, proposed it as a resuscitative in drowning, suffocation and protracted fainting. It would seem worthy of a trial in the threatened syncope from chloroform; since the inhalation of but a few drops is followed by marked acceleration of the heart and flushing of the face. The writer poured about eight drops upon a towel, and, as an experiment, snuffed it two or three times, when immediately the radial pulse became accelerated, the heart throbbed with much force, and the pulsation of the cranial vessels became almost painful. At the same time there was a decided tingling of the ears. The symptoms lasted but a few moments, the tingling remained after the circulation had become quiet.

This agent has been used successfully in England by Dr. Brunton and Dr. Anstie for the purpose of alleviating the spasm of angina pectoris.* It will probably now undergo the lot of each new therapeutic agent,† and pass the ordeal of hundreds of investigators. F. A. BURRALL, M.D., June 8, 1870.—*New York Medical Gazette*, June 11, 1870.

*N. Y. Medical Gazette, April 2, 1870.

† It may be obtained from Mr. Spangenberg, 1165 Broadway.

Preparation of Pure White Gutta Percha.—This substance is now much used in dentistry and for other purposes, and as different qualities, some of them very inferior, are in the market, some of our professional readers may thank us for the details of a simple process for manufacturing it. Four ounces of the purest gutta percha that can be selected are to be digested for several days with five pounds of methyl-chloroform, until a solution is obtained thin enough to pass through filtering paper, care being taken during the operation to prevent any loss of the chloroform by using the apparatus constructed for that purpose. The solution is then to be filtered (an additional pound of chloroform will facilitate this), and should then be clear and nearly colorless. Alcohol is now to be added in sufficient quantity to precipitate the gutta percha in a voluminous white mass, which then is to be washed with alcohol, pressed in a cloth and dried in the air. It must finally be boiled in water in a porcelain vessel for half an hour, and while still hot rolled into sticks. The chloroform can be separated from the alcohol by adding water, and the alcohol recovered by distillation.—*Journ. of Applied Chemistry*, July 1870.

Cement for Knife Handles.—The best cement for this purpose consists of one pound of colophony (purchasable at the druggists) and eight ounces of sulphur, which are to be melted together, and either kept in bars or reduced to powder. One part of the powder is to be mixed with half a part of iron filings, fine sand or brick dust, and the cavity of the handle is then to be filled with this mixture. The stem of the knife or fork is then to be heated and inserted in the cavity, and when cold it will be found fixed to its place with great tenacity.—*Druggists' Circular*.

Black Varnish for Iron-work. Asphaltum, 48 lbs., fuse; add boiled oil, 10 gallons, red lead and litharge, of each 7 lbs.; dried and powdered white copperas, 3 lbs. Boil for two hours; then add dark gum amber (fused), 8 lbs.; hot linseed oil, 2 gallons; boil for two hours longer, or till a little of the mass, when cooled, may be rolled into pills; then withdraw the heat, and afterwards thin down with oil of turpentine, 30 gallons. Used for the iron-work of carriages and for other nice purposes.—*Drug. Cir. and Chem. Gaz.*, March, 1870, from *Blinn's Workshop Companion*.

Experiments on the Production of Sulphuric Acid from Gypsum. H. REINSCH. A quintal (hundredweight) of gypsum, $\text{CaO}, \text{SO}_3 2\text{HO}$, contains about 57 lbs. of sulphuric acid (so-called English). The author, after referring to the very many hitherto unsuccessful attempts made to obtain this acid from this most abundantly-found mineral, states that, when he mixed two parts of pulverized gypsum with one part of carbonate of ammonia, and poured water over this mixture, complete decomposition of the gypsum ensues, sulphate of ammonia is formed, and carbonate of lime.

The sulphate of ammonia is, in its turn, decomposed by means of common salt, the result being the formation of sulphate of soda and chloride of ammonium, which can again be converted into carbonate of ammonia by means of chalk.—*Chem. News*, July 8, 1870.

Jewish Physicians in Rome. Although Roman history mentions a large number of celebrated Hebrew physicians, who attended former Popes in cases of severe sickness, and although Leo X's body physician was a Jew, the practice of medicine is at the present time allowed to Jews only on the condition that they confine themselves to members of their own religion. A Hebrew doctor, who, two years ago, attended to a Catholic who had fainted in the street, and visited him at his special request, at his home, escaped punishment only through the intercession of some influential persons. The practice of pharmacy in Rome is absolutely prohibited to Jews.—*Pharm. Zeitung*.

Female Students. The University of Zurich, Switzerland, has now 14 female students, 12 of whom have matriculated in the medical and 2 in the philosophical department. The rectorate of this university say, that the presence of females in the theoretical and practical courses has created no difficulty whatever. Lectures and demonstrations are given without regard to the presence of ladies, also the anatomical exercises and clinical exhibitions. With an experience of six years, the faculty look calmly forward to the solution of this question. The faculty are, however, of the opinion, that for the result thus far obtained, the determined love of labor and the genteel behaviour of the lady students, also the political status and the serenity of the Swiss students, is to be taken into account.—*Pharm. Zeitung*, Bunzlau, N. 43.

White Cinchona Bark from Payta. O. HESSE. The author found that this bark contains, beside paytin, so large a quantity of starch that the bark might be used as a fermentable and distillable alcohol-producing material. The paytin is a new alkaloid, readily soluble in alcohol, ether, benzine, and chloroform; difficultly soluble in water, in potassa solution, and ammonia; it fuses at 156° , combines with acids, forming salts and double salts. The formula of paytin is $C_{21}H_{24}N_2O$.—*Chem. News*, Aug. 12, 1870.

On Agoniada and Agonidine. DR. P. PECKOLT. The author has extracted from the agonia bark (*Plumeria lancifolia*), a tree indigenous to the Brazils, the bark being largely used in that country as febrifuge, a substance which he calls agonidine, a crystalline matter, devoid of smell, of a very bitter taste, difficultly soluble in ether, but more readily so in boiling alcohol and boiling water, does not sublime on being heated, is soluble, also, in solution of caustic potassa; in ammonia and in concen-

trated sulphuric acid, the latter solution is at first of a golden-yellow color, but turns gradually green. Upon the addition of nitric acid to the sulphuric acid solution of agonidine, a yellow-colored flocculent matter is separated; this substance is a glucoside identical with arbutine, and contains no nitrogen. The formula of agonidine is $C_{10}H_{14}O_6$.—*Chem News*, Aug. 12, 1870.

Editorial Department.

MEETING OF THE ASSOCIATION AT BALTIMORE.—The following notice of the President was published in our August advertising sheet, and is reprinted here for record. Appended to it is the Notice of the Permanent Secretary, giving details useful to visitors.

NOTICE OF THE ANNUAL MEETING.

The 18th Annual Meeting of the American Pharmaceutical Association will be held in the city of Baltimore on the second Tuesday (the 13th day) of September, 1870, commencing at 3 o'clock, P. M. The place of meeting and the arrangements for the accommodation of those who will be in attendance, will be announced by the Local Secretary. It is expected that the several standing and special committees will be prepared with full and highly instructive reports on the many important subjects which should engage our attention at this time. The central position of Baltimore will afford opportunity for many to be present at this meeting who have not usually met with us. A full attendance of the members is earnestly desired, as among the important business to be brought forward will be the revision of the Constitution, more particularly in reference to improving the financial status of the Association.

Pharmacists and druggists eligible to membership are earnestly invited to forward or present their names for election, and thereby aid in extending the usefulness of this Association. Those desiring to join can obtain the necessary blank applications from the Chairman of the Executive Committee, Mr. Thos S. Wiegand, 528 Arch St., or from the Permanent Secretary, Prof. John M. Maisch, 1607 Ridge Avenue, Philadelphia.

A cordial invitation is extended to all engaged in manufactures connected with pharmacy or with chemistry, to send specimens of their productions for exhibition during the session. These may be sent to Prof. J. Faris Moore, Local Secretary, Baltimore, accompanied with an invoice and a full description of the articles sent.

E. H. SARGENT, President.

Chicago, July 1, 1870.

The Eighteenth Annual Meeting of the American Pharmaceutical Association will be held on the second Tuesday, the 13th day of Sept., 1870, at 3 o'clk, P. M., in the building of the University of Maryland, on West Lombard Street, in the City of Baltimore. Ample accommodations have been secured in the same building for the exhibition of Drugs, Preparations, Apparatus, Models and Specimens interesting to and connected with the business of the Pharmacist. The central location of Baltimore, in connection with the important subjects to be reported and to be acted on, will render this meeting one of the most important ones.

The Fountain Hotel, located on Camden, near Howard St., has been selected as the Headquarters, and accommodations have been secured for members and their families at a reduced rate.

You are earnestly requested to be present at this meeting, and to extend the usefulness of the Association, by urging those of your friends who are eligible, to join in membership. Blanks for this purpose, with all the necessary information, will be promptly forwarded on application to the undersigned or any member of the Executive Committee.

You are likewise requested to send and cause to be sent, for exhibition, any Specimens of interest to the Profession. The Local Secretary, Professor J. Faris Moore, will take charge of all goods intended for exhibition during the meeting; or, they may be consigned to the care of Messrs. SHARP & DOHME, Cor. Howard and Pratt Sts. Goods intended for exhibition, ought to be forwarded free of charge, during the first week of September, and be accompanied with an invoice and a condensed description of the articles sent.

Very respectfully,

JOHN M. MAISCH,

Permanent Secretary, Amer. Pharm'l Assoc'n.

Philadelphia, August 5, 1870.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The changes which have been going on in the policy of this Society since the Act of Parliament granting it the power to carry out that Law of Registration and Examination, have been marked with some features that deserve a notice. At the institution of that Society, or soon after, Parliament granted the privilege or right of using the name "pharmaceutical chemist" solely to its members, as a distinctive mark. Notwithstanding its numerous membership at the beginning (over 3000) it represented only a minority of the actual number of persons engaged in the dispensing of drugs. The educational measures instituted by the Society at London directly and indirectly through the influence of members in other parts of the country, aided largely by the wide distribution of the *Pharmaceutical Journal*, raised the status of the Society and gave it an influence which was used skilfully at times, when the subject of a sale of poisons law and other measures were before Parliament. Meanwhile the large body of "chemists and druggists" became affected by induction; many of them were able men, and a *Journal* advocating their interests was instituted. The idea of breaking down the barrier which lay between themselves and the pharmaceutical chemist was broached, and culminated in the suggestion of an Annual Meeting, where both branches could meet on common ground, and act in unison in the prosecution of scientific inquiries and professional improvements. The influence of these annual gatherings was most happy, as well on the Society as on the chemists and druggists; a better feeling was created, and when in 1868 the subject of the sale of poisons again agitated Parliament, the Society, greatly aided by its President, Mr. Sanford, urged a law requiring all who sold poisons to be registered, and all who dispensed medicines as pharmacutists to be examined. Those passing the higher examination to be pharmaceutical

chemists and members of the Pharmaceutical Society, and those sustaining the minor examination to be "chemists and druggists." The confidence reposed in the Council of the Society by Parliament was certainly very flattering to that body, and was well deserved. But the object of this note is more particularly to call attention to the effect of these changes on the Society itself. Until recently the Council of the Society sat with closed doors, their action almost entirely centered in the London members, and they were able to do pretty much as they pleased in the management. Recently, however, the "country members" have come forward at the Annual meetings, and have made themselves felt; have broken down much of the exclusiveness that formerly obtained, by rearranging the by-laws, and infusing a larger representation of their numbers into the Council. The meetings are also thrown open to reporters. The Annual Meeting in May last was marked by unusual agitation from the outspoken country members, and at the election which followed the constitution of the Council was modified. The votes of the members not present are given by proxy. Voting papers are used by all the members, and the votes are counted by a committee of scrutineers. On this occasion, one of these, named Dickinson (the same who formerly caused so much trouble to the Society in the days of Jacob Bell) so far forgot his duty as a man and a member as to resort to fraud in counting the votes, which resulted in the necessity of re-counting them in the presence of experts, when the fraud was determined. Mr. Dickinson subsequently acknowledged his guilt, exonerated all others, and gave as a reason his wish to test the flimsy and faulty method of voting, which, being made for honest men, had no provision against such treason as he manifested. The feeling created by this outrage has been almost universal against its author.

OFFICERS OF THE PHARMACEUTICAL SOCIETY for 1870-71.—At a meeting of the council held June 1st, 1870, George Webb Sanford, was elected *President*; Adolphus F. Haselden, *Vice President*; Thomas Hyde Hills, *Treasurer*; Elias Bremridge, *Secretary* and *Registrar*; and Richard Bremridge, *Assist. Secretary* and *Deputy Registrar*.

THE PHARMACEUTICAL JOURNAL.—After the death of Jacob Bell a new series of this Journal was commenced, under the editorship of Profs. Redwood and Bentley aided by others, until the present year. Among the changes brought about by the country influence on the Council was one directed to the management of the Journal; the country members complained that they were not sufficiently represented, and urged a change. A committee appointed to consider the matter reported in favor of making the Journal weekly, and giving more space to subjects of general and scientific interest and less to strictly society matters. The Editorship having been made elective, the new Council advertised for candidates, and early in July an election was held, which resulted in

the election of Dr. B. H. Paul, who has taken charge of the work. The Journal is wholly changed in its character, its size is royal octavo, double column, twenty pages in a number, with an advertising sheet of twenty pages, and without a cover. As a vehicle for scientific information its style and capacity have much improved, as the discussion of the policy and special interests of the Society, which formerly occupied so much space, has been made subordinate. To Prof. Redwood it must be a great relief, but after his long and valuable services as principal Editor he should not have been thrown out in so abrupt a manner.

THE CHEMIST AND DRUGGIST.—LONDON.—The July number of this Journal informs that Mr. John C. Brough, its Editor, has been elected to the Librarianship of the London Institution, a position for which he is said to be well qualified. Mr. Brough will continue to contribute to the Chemist and Druggist. The offer of a prize for the best model for a dispensing counter is made in a recent issue. This subject has not attracted much attention in the United States, each proprietor having his own ideas of comfort and adaptation in the details,—some using the crudest arrangements, and others observing great ingenuity in saving labor and promoting the comfort and exactitude of the dispenser.

DR. FREDERICK A. FLÜCKIGER, State Apothecary at Bern, so favorably known as a writer on pharmacognosy and organic analysis has recently received the appointment of the professorship of pharmacy and pharmacognosy in the University of Bern. The extraordinary ability and industry which Dr. F. can bring to bear in his new position will enable him to illustrate the chair greatly to the advantage of his pupils. Dr. F.'s cabinet of materia medica is very interesting, as well for its variety as from the fact that the specimens are accompanied in many instances with the principal constituents isolated by his own industry and researches, and it will greatly add to his means of illustration.

ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY.—We have been requested to publish the following:

“The Executive Board of the Alumni Association are pleased to announce that a sufficient proportion of the Laboratory Fund has been collected to enable the College to establish the School for Practical Instruction during the coming winter. The Board would earnestly impress on those who have subscribed, the importance of handing in the amount of their subscriptions at the earliest moment.

CLEMMONS PARRISH, *Secretary.*

“At a recent meeting of the Executive Board of the Alumni Association it was resolved, to offer a prize of a gold medal to the graduate of the Philadelphia College of Pharmacy who shall be deemed by the Board of Examiners the most proficient.

CLEMMONS PARRISH,
Secretary.”

THE ASSOCIATION OF THE ALUMNI OF THE MASSACHUSETTS COLLEGE OF PHARMACY.—A letter from Thos. Doliber, Secretary of that Association, informs that J. R. Cheney, T. Doliber, J. C. Lowd, C. A. Tufts, and A. B. Warfield have been elected delegates to the American Pharmaceutical Association, to meet in Baltimore on the 13th of September next.

LOUISVILLE COLLEGE OF PHARMACY.—By the following extract from the Louisville Commercial of August 8th, it will be perceived that our Kentucky confreres are waking up to the necessity of helping themselves in the matter of education. The movement noticed below, though only for organization, is a proper preliminary to a school of pharmacy, and it is to be hoped that at an early date such a school will be opened.

"The necessity of a college of pharmacy in our midst has long been felt by the pharmaceutists of Louisville, but it is only within the last few months that steps have been taken to organize such an institution. It will be seen below that the druggists of Louisville and the cities of New Albany and Jeffersonville held a meeting in the lecture hall of the Louisville College of Medicine, at which this organization was effected, and to judge from the enthusiasm and unanimity of action manifested, the Louisville College of Pharmacy will be a success from its very inception.

"The objects of the college are the cultivation, improvement, and diffusion of the science and art of pharmacy by instituting and maintaining a school of pharmacy, and by the interchange of knowledge among its members and the profession in general. It is proposed to hold monthly pharmaceutical meetings, at which all matters of interest to pharmacy are brought up and discussed; and this will probably be the extent of usefulness of the college at present. By proper energy, however, it is hoped that a school may be opened at an early date, and to this end the members of the college have pledged their heartiest co-operation and support.

"Below is appended a communication from the recording secretary:

"At a general meeting of the druggists of Louisville and vicinity, held in the lecture hall of the Louisville Medical College, on Tuesday, August 16th, at 2 o'clock P. M., an association called the Louisville College of Pharmacy was organized by the adoption of a constitution and an election of the following officers:

"President—C. Lewis Diehl.

"Vice Presidents—B. F. Scribner, of New Albany, and Geo. A. Newman.

"Recording Secretary—Fred. C. Miller.

"Corresponding Secretary—Louis Eichrodt.

"Treasurer—Geo. F. Cary.

"Curator—J. A. McAfee.

"Trustees—Thos. E. Jenkins, S. F. Dawes, Dan. B. Grable, Ferd. J. Pfingst, and John Colgan.

"A committee on by-laws and code of ethics, consisting of Messrs. Thos. E. Jenkins, Geo. T. Cary, and B. F. Scribner, was appointed and instructed to report to the board of trustees, who were empowered to accept the same, subject to the approval of the college at its next regular meeting.

"Messrs. Geo. S. Newman, J. M. Krim, and Jas. E. Brown were appointed a committee to obtain a charter for the college as soon as practicable.

"After the transaction of some minor business the college tendered

a vote of thanks to the dean and faculty of the Louisville Medical College for their courtesy in proffering the use of their lecture hall. After which a motion to adjourn until the next general meeting was adopted.

“FRED. C. MILLER, Recording Secretary.”

“The board of trustees have called a meeting for next Tuesday, Aug. 23d. at 3 o'clock P. M. The time for the pharmaceutic meetings will be announced at an early date.

UNIVERSITY OF GETTINGEN.—The chair of chemistry at this institution, vacated by the transfer of Prof. Fittig to the University of Tübingen, has been filled by Dr. Hans Hübner as extraordinary professor in the philosophical faculty.

UNIVERSITY OF PENNSYLVANIA.—In justice to the fair fame and the well merited renown of the University of Pennsylvania, the oldest institution of the kind in this country, our European exchanges are requested to contradict the report that the medical faculty thereof are granting diplomas to any one on the payment of forty to fifty dollars. This assertion of a N. Y. Journal some months ago, was at once corrected in the United States; but Prof. Maisch informs us it found its way into the usually well informed *Pharm. Zeitung* of Bunzlau, and on its authority is going the round through the scientific journals of Europe. The above charges refer to another institution, bearing a similar name, and also located in Philadelphia, but without standing in the medical profession; while the medical faculty of the University of Pennsylvania are honestly endeavoring to sustain the reputation which has been established by the earnest and conscientious labors of some of the most celebrated physicians of America during a period of one hundred years.

THE ROYAL RHENISH-WESTPHALIAN POLYTECHNIC SCHOOL AT AIX-LA-CHAPELLE.—The Prussian government, in carrying out its intentions of increasing the means of scientific and artistic education, intends opening, on the 10th of October at Aix-la-Chapelle, an extensive polytechnic high school of the same kind as those at Hanover and Berlin, and a combination of the aims and scope of the “Ecole Polytechnique,” “Ecole des Mines” and the “Ecole Central des Arts et Manufactures” at Paris. The *Chemical News*, in speaking of this Institution, says: “The main subjects of ordinary instruction are fifty-eight in number, and besides these thirteen extraordinary subjects will be given; in fact, as might be expected from the Prussian government, the establishment is in every respect complete. The building is an imposing and beautiful one, of large dimensions, fitted up with all the requisites for this purpose. It has been erected in a city, the best which could be selected in Rhenish Prussia, since it is readily accessible, its situation healthy, and what is of more importance it is eminently the centre of a large manufacturing, mining, and technically highly developed district, and at an easy distance as well from the Rhine as from Belgium and France. The fees are exceedingly moderate, and

the appointed teachers are men of experience as well as of high scientific standing." These schools open a most valuable opportunity for earnest young American minds who are able to qualify themselves as missionary teachers of science and art in this country by a thorough course of study abroad, and it is greatly to be hoped that such will be encouraged to go abroad and fit themselves to serve their country in this most efficient and praiseworthy manner.

A PHARMACEUTICAL INSTITUTE is to be connected with the University of Marburg, Germany; the plans for the building have already been approved.

CO-OPERATIVE TRADING, APPLIED TO MEDICINE AND PHARMACY.—For sometime past a system of joint stock trading has been carried on in London, with a view to the supply of food, clothing and other necessities of life to the classes in moderate circumstances who contribute. The bearing of this system on regular trading has been discussed in several letters and articles contained in the *Pharmaceutical Journal* for 1869-70, and although the question has arisen as to whether such trading pays in the long run, it is quite certain that it interferes with the legitimate channels of trade. The editor of the *Pharmaceutical Journal* calls attention to a new form of this co-operation called the "Metropolitan Mutual Medical Aid Society," designed to supply medical and surgical aid, and medicines to the subscribers. The society is only intended for persons of very moderate income, and does not include attendance in accouchments or incurable cases.

The editor remarks, as many of the contributors to co-operative stores are medical men, they cannot complain if the tables are reversed.

ILLUSTRATIONS OF THE GENUS *CINCHONA* BY DR. MUTIS.—We learn from the *Pharm. Journ.* of Aug. 13, that the drawings executed under the direction of the celebrated Dr. Mutis at the end of the eighteenth century, and which were discovered by Mr. Clements R. Markham in an outhouse in the botanical garden at Madrid with some of the MSS. of that writer, are about to be republished.

BETTS' METALLIC CAPSULES.—The suits in Chancery which have been pending about five years, commenced by a Mr. Betts, agent or proprietor of the capsules of metal, originating in a French patent for capping bottles, have recently been brought to a termination favorable to the defendants (druggists and others) before Vice Chancellor James. There were twenty-five separate bills against retailers of capsuled articles, and Mr. Betts sought injunctions, damages and costs. When the testimony was given in it appeared that the suits were commenced on a very slim basis, viz., a single capsuled bottle for each, which Betts stated were of

"foreign manufacture." On cross-examination it was made to appear that the very capsules on which the suits were brought were made by the Paris house of the prosecutor (!) and that he was acting in a double capacity. The suits were all dismissed with costs and the plaintiff condemned in strong terms by the Vice Chancellor.

THE EIGHTH EDITION OF THE AMERICAN DISPENSATORY (ECLECTIC).—We have received a circular from Messrs. Wiltach, Baldwin & Co., of Cincinnati, stating that they are about to publish a new and extended edition of Dr. John King's work on *Materia Medica*, "The American Dispensatory, which has been "completely revised and largely re-written," in one royal octavo volume of 1440 pages—price, \$10. From the long delay which has occurred it is probable that Dr. King has made many changes and additions.

Archives of Ophthalmology and Otology. Edited and published simultaneously in English and German, by Prof. H. Knapp, M.D., in New York, and Prof. S. Moos, M.D., in Heidelberg. Vol. I, No. 2. New York: William Wood & Co. Carlsruhe; Chr. Fr. Muller'sche Hofbuch-handlung, 1870. pp. 357.

This most elegantly gotten up of the medical serials makes its appearance in No. 2, thus completing the volume of 723 pages with eleven plates besides numerous wood cuts, and embraces twenty-four articles, fourteen of which are written here and ten in Germany, and translated here for this work. The growing importance of the specialities of which it treats renders the "Archives" a valuable addition to the medical library of the practising physician. The price of the work is \$7.00 per annum.

The American Chemist: a monthly journal of theoretical, analytical and technical chemistry. Edited by Charles F. Chandler, Ph.D., and W. H. Chandler. Published monthly in numbers of forty pages each, royal octavo, by William Baldwin & Co., 434 Broome st., New York. July 1st, 1870.

Many of our readers are aware that a reprint of the *Chemical News*, a weekly journal of London, edited by William Crookes, F.R.S., has been republished during the past three years in monthly numbers under the same name with a supplement of American origin. The proprietors of the *American Chemist* having purchased the stock and other interest of the reprint of the *Chemical News*, "have decided to advance the interests of American chemical science, by the publication of a journal which shall be a medium of communication for all practical, thinking, experimenting and manufacturing scientific men throughout the country," and have placed it in the editorial charge of Prof. C. F. Chandler and W. H. Chandler of the School of Mines, New York. This change is highly important, first because the reprint of the *Chemical News* did not fairly

represent that work, the matter being arranged differently; but chiefly because it gives us an American journal in capable hands entirely devoted to chemical science. During the current year the editors will extract largely from the Chemical News as a duty to the transferred subscribers, after which the American Chemist will be entirely independent. The enterprise has our best wishes for its success.

The Half-yearly Abstract of the Medical Sciences, being a digest of British and Continental medicine and the collateral sciences. Edited by William Dormett Stone, M.D. Vol. LI. July, 1870. Philada.: Henry C. Lea; pp. 296 octavo. \$2.50 a year in advance. Single numbers, \$1.50.

Braithwaite's Retrospect of Practical Medicine and Surgery. Part LXI. July, uniform American edition. New York: W. A. Townsend and Adams publishers, 1870. \$2.50 a year, in advance; or \$1.50 per single part.

Half-Yearly Compendium of Medical Science; a synopsis of American and Foreign literature of medicine, surgery and the collateral sciences, for six months. Edited by S. W. Butler, M.D., D. G. Brinton, M.D., and G. H. Napheys, M.D. Part VI. July, 1870. Philada.: S. W. Butler, M.D., 115 South 7th St. \$3.00 a year, in advance; \$2.00 for single numbers.

These semi-annuals all contain a great variety of valuable papers from the journals of Europe and the United States, relating mainly to medicine and surgery. The two first are reprints, the last an original compilation of the same character. They are too well known in medical circles to need even this explanation. They are all sent *post paid* for the subscription price.

Twenty-seventh Annual Report of the Managers of the State Lunatic Asylum for the year 1869. Albany, 1870: pp. 92, octavo.

The Proof Sheet; a bi-monthly typographical magazine issued by Collins & McLeester, type founders, Philada. Pp. 20, royal octavo.

The Proof Sheet is a happy way of showing neat printing from beautiful type on superb paper, and to those connected with the press or who have to do with selecting type for labels this bi-monthly will prove a useful visitant. Price \$1 per annum.

Artificial Refrigerators.—Carré's and Mignon and Rouat's continuous freezing apparatus. for the production of ice by the direct action of heat. Philada., 1870. By M. J. Bujac of New York, 17 Broad St.

This is a pamphlet of seventeen pages with three illustrations, intended to explain M. Carré's apparatus described in this journal in March last.

Much attention has recently been given by Mr. Bujac to the reduction of the temperature of apartments for brewers and others requiring a modified and regular heat. Those desirous of information on the subject would do well to get the pamphlet as above.

OBITUARY.

SIR JAMES CLARK, Bart., M.D., F.R.S., died at Bagshot Park, Surrey, on the 29th of June. He was born in 1788, educated at King's College, Aberdeen, completed his medical studies at Edinburgh University, passed some years as Surgeon in the Navy, settled at Rome in 1820, returned to London in 1826, became physician to the Duchess of Kent and Princess Victoria, and was knighted by the latter after her accession to the throne. Sir James took a lively interest in the proceedings of the Pharmaceutical Society at the time of its establishment and afterwards.

ALBRECHT VON GRAEFE—This celebrated physician and oculist, whose recent death is announced in the journals, was born in Berlin in 1825, and was the son of an eminent surgeon. After finishing his academic studies, he spent some time in England in company with Prof. Donders, of Holland, and returning to Berlin established the Ophthalmic Hospital now so celebrated. In 1853, in connection with Arlt and Donders, he founded the *Archiv. für Ophthalmologie*, to which he continued to his death an active contributor. His great discovery was that glaucoma, or disorganization of the eye-ball, could be arrested by iridectomy. "The Lancet" says of him: "There can hardly be, either in Europe or America, a community of 10,000 persons which does not contain at least one individual who is in the enjoyment of vision that has been preserved by iridectomy, and who if Von Graefe had not lived would now be unable to see the sun." As a physician he owed much of his success to a combination of suavity and firmness of manner, and, like Simpson, was followed to the grave with profound regret by a wide circle of friends and patients.

M. SEMBENINI, of Verona, Italy, died recently, aged sixty-five years. He took much interest in the literature of Italian Pharmacy, and was the translator of the "Codex Francaise," the *Traité de Pharmacie* of Soubeiran, and other works.

M. LEROUX, pbarmacien of Vitry-le-Francais, was buried on the 22d of May, 1870, at the age of 65 years. He was the discoverer of salicin.

JAMES COPLAND, M.D., F.R.S., of London, eminent as a medical writer and practitioner, died on the 12th of July, at Kilburn, in his 79th year.

THE
AMERICAN JOURNAL OF PHARMACY.

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NOVEMBER, 1870.  
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EIGHTEENTH ANNUAL MEETING OF THE AMERICAN
PHARMACEUTICAL ASSOCIATION, HELD AT BALTI-
MORE.

FIRST SESSION.

The Eighteenth Annual Meeting of the American Pharmaceutical Association convened in the lecture-room of the University of Maryland, in the City of Baltimore, Maryland, on the 13th of September, 1870, at 3 o'clock P. M. President Sargent, in calling the meeting to order, said:

"I wish to announce, before proceeding to the regular business of the session, that the British Pharmaceutical Conference assembled at three o'clock to-day in the City of Liverpool. This concurrence in the time of meeting of two kindred Associations, in different and widely separated nations, would seem to render appropriate something more than a formal recognition of the fact, and to call for some expression of our interest in an Association having the same aims as our own, and speaking the same language."

The following Committee on Credentials was then appointed, viz., William S. Thompson of Baltimore, James T. King of Middletown, N. Y., Newton Pierpoint of Illinois, who, after consultation, reported the following gentlemen as duly accredited to this meeting:

From the Philadelphia College of Pharmacy.—W. Procter, Jr., J. P. Remington, Alfred B. Taylor, James T. Shinn, Henry N. Rittenhouse.

From the Maryland College.—George W. Andrews, Oscar Monserrat, N. H. Jennings, Louis Dohme, John F. Hancock.

From the New York College.—P. W. Bedford, George C. Close, Isaac Coddington, David Hays, William Neergaard.

From the Massachusetts College.—Samuel M. Colcord, George F. H. Markoe, Robert R. Kent, Joel S. Orne, Benj. F. Stacy.

From the Chicago College.—Albert E. Ebert, Thomas Whitfield, N. Pierpoint, Dr. F. Mahla, E. H. Sargent.

From the California Pharmaceutical Society.—William T. Wenzell, Wm. A. Perkins.

From the Newark Pharmaceutical Association.—John B. Lee, Ransford W. Vandervoort, Alex. Havenstein, Chas. W. Badger, Edward P. Nichols.

New Jersey Pharmaceutical Association.—Joseph De la Cour, Jr., Randal Rickey, William Rust, Ed. F. Kelly and Julius Fehr.

Alumni Association of the Philad. Coll. Pharm.—Charles L. Jefferson, Joseph A. Souder, S. Mason McCollin, P. Joseph Carberry and Clemmons Parrish.

Alumni Association of the Massachusetts College.—Judson R. Cheney, Thomas Doliber, John C. Lowd, Charles A. Tufts, Abijah B. Winfield.

The Executive Committee reported the following applications for membership, all of whom had complied with the requirements of the Constitution. A ballot being ordered, P. W. Bedford and Edwin McC. Boring, tellers, reported their unanimous election :

Simon N. Jones, Louisville, Ky.
 James E. Brown, "
 Peter Nodler, Covington, Ky.
 John M. Cutler, Albany, N. Y.
 James N. Hedenberg, Danville, Pa.
 J. Otis Barnaby, Brooklyn, N. Y.
 Thos. J. Barnaby, Elizabeth, N. J.
 Albert R. Griffith, Oil City, Pa.
 Wolfred D. E. Nelson, Montreal,
 Canada.
 Chas. M. Hostetter, Pittsburg, Pa.
 Theo. W. Ruete, Lockport, N. Y.
 Linton Smith, M.D., Wilmington,
 Del.
 Paul L. Viallon, New Orleans, La.
 H. L. Sherwood, Po'keepsie, N. Y.
 Wm. H. Egle, Harrisburg, Pa.
 Wm. H. Naulty, Little Rock, Ark.
 Frank L. Steele, Memphis, Tenn.
 Alfred Ritson, Columbus, Ohio.
 T. Smith Glenn, St. Louis, Mo.
 Wm. Hall, Wickham, N. Y.

Eugene A. Rau, Bethlehem, Pa.
 William Krause, Philad.
 Wm. Trindle, "
 Jos. T. Thibodeaux, Thibodeaux, La.
 Marshall C. Hall, Fredericksburg,
 Va.
 John A. Webb, Baltimore, Md.
 Z. W. Cromwell, Washington, D. C.
 A. W. Nolting, Richmond, Va.
 Chas. G. Parker, Mobile, Ala.
 Clarence A. Evans, Muncy, Pa.
 F. A. Graefle, Hagerstown, Md.
 J. A. O'Donnell, Washington, D. C.
 John H. Hancock, Baltimore, Md.
 John F. Huddart, Philad.
 John F. Cahill, Cardenas, Cuba.
 Judson S. Jacobus, Chicago.
 Hosea W. Palmer, Hyde Park, Ill.
 A. W. Duke, Baltimore, Md.
 Alfred A. Hubley, Lancaster, Pa.
 Edward A. Smith, Baltimore, Md.

The roll of members was now called by the Secretary, the entire attendance being 106 members.

The Reports of Committees being in order, the following were laid on the table:

The reports of the Executive Committee and the Permanent Secretary.

The report of the Committee on the Progress of Pharmacy.

“ “ Committee on Scientific Queries.

“ “ Constitution and By-Laws.

“ “ Secretary on Legislation.

No reports were received from the Committees on Drug Market, on Unofficial Formulas and on Photograph Album.

The Chairman of the Executive Committee, Mr. Wiegand, being absent (because of an accident), Mr. Taylor of the Business Committee read his report, which was accepted and referred. The Permanent Secretary then read his annual report of the publication of the Proceedings, etc., which was accepted.

[The Executive Committee report that the Volume of Proceedings was issued early in February, that a number of applications for membership were made in the interim, and that more attention is needed to the finances of the Association. The chief burthen of the report is, however, its Obituary notices. Eight members have succumbed to the pale messenger since last report, viz.:

Prof. F. F. Mayer, formerly of the New York College of Pharmacy, is supposed to be dead, as the most diligent inquiry of his friends in New York have not availed to find his whereabouts. When last seen, between Christmas and New Year, he was suffering much from neuralgia, to which he was a victim, and his friends consider him as dead. It seems hard to reconcile so sad a fate as death without the knowledg of friends, to one so well known. Several of his papers are scattered through this Journal, and give evidence of marked ability.

William Ellis Jenkins, of Boston, a graduate of the Massachusetts College, died Dec. 6th last. He was a member of four years' standing, and his friends testify to his professional skill and personal worth.

Arthur W. Gabaudan, of New York. (See page 191, vol. xlii.)

Peter V. Coppuck, of Mt. Holly, N. J. (See page 92, vol. xlii).

John Sylvester Benzinger, of Baltimore, died Dec. 14, 1869, and had been a member nine years.

William H. Muller, of Chicago, Ill., died in the 43d year of his age. He was educated in Hameln as a pharmacist, and graduated at the University of Göttingen.

Henry G. D'Evers, of Chicago, Ill., was born in Hanover, Germany, studied at the Universities of Giessen, Göttingen and Jena. He emigrated to America in 1848, residing successively in New York, Sandusky, Buffalo and Chicago, and was a pharmacist in good esteem. His death was the result of accident. He leaves a wife and three children.

Herschel Parker, of Brooklyn, N. Y., died on the 8th of August, 1870, in his 41st year. He was a pharmacist in good standing, and has been three years a member of this Association.

The report also contains notices of *M. Boullay* and *M. Robinet*, both of whom were honorary members of the Association, but, as we have published obituary notices already (see page 93 and 192 of this volume) it is not necessary to repeat them.]

[The report of the Permanent Secretary to the Executive Committee contains various information of interest relative to memberships, the stock of Proceedings, the distribution of the Proceedings to American and foreign libraries and societies, and the expenses of the year. The Secretary advises the reduction of the number of complimentary copies distributed, as various bodies publishing journals and editors of journals either fail to exchange altogether or do it so irregularly that no advantage comes to the Association from a continuance of the exchange.]

Mr. Taylor then offered the following:

Resolved, That the Secretary be requested to telegraph a fraternal message to the British Pharmaceutical Conference, now in session in Liverpool.

The delegations were then called on to name each a member to serve on the Nominating Committee.

Samuel M. Colcord, David Hays, James T. Shinn, J. P. Han-

cock, A. E. Ebert, W. T. Wenzell, Randall Rickey, J. L. Carberry, Charles A Tufts, Edward P. Nichols, were appointed by the delegations, and Fleming G. Grieve, John A. Vandegrift, and Matthew F. Ash by the President.

The President now read his annual address.

[The President, after some generalities in relation to reunion with friends, etc., said that the national character of our Association renders it of the greatest importance that the conduct of its affairs be marked with wisdom and foresight, and that now, while prosperity surrounds us, that we build our structure on a sound financial basis. This is not yet attained, and although we are out of debt, it is due to the efforts of the Treasurer in anticipating the coming income. Our usefulness depends on ample resources. Social pleasures are desirable, but the development of energy and talent in the members is more so. Officers of the Association are embarrassed by a deficient treasury, and are overworked in consequence. We owe it to our own self-respect that these officers be better paid. The necessity of increasing the annual dues, as will be brought forward by the Committee on the Constitution, will be apparent. Under the present dues each member pays but fifty cents more than he receives in the form of printed matter, which will not support the Association. The idea of life memberships, based on a fair contribution, is fully discussed, and advocated provided the capital be funded.

The President also recommends funding the initiation and certificate fees, and using the income as prizes for scientific research. He also advocates the propriety of members offering prizes through the Association. That the annual dues *should* fully pay the annual expenses is assumed as a truism.

The President compliments the Executive Committee, the Secretary, and Mr. Slade the Phonographic Reporter, for the excellence of the volume of Proceedings. He also refers to the report on the Progress of Pharmacy, and advocates that the Chairman be furnished with the necessary journals by subscription, and not be dependent on the very irregular exchange of those journals with the Proceedings.

The importance of having a working Committee on Adulterations is advocated as a duty to the public and physicians.

"No sin deserves more severe rebuke or more prompt punishment than that which silently and unknown works mischief and death upon the suffering invalid.

"Our State laws are defective and Public Justice is blind, but if we had an active Committee to ascertain facts of this nature, its annual report would doubtless exert a powerful influence to check this growing and unblushing evil, would place us fair upon the record, give our law-makers a basis to work upon, and would result in great practical benefit to all."

Dishonesty in pharmacopœial preparations is pointed out as properly within the duty of this Committee.

The President suggests the preparation of another general index; advocates the appropriation of time to the exhibition of specimens and apparatus. He also advocates having an agent or honorary secretary in each State, to collect the dues of members and distribute the Proceedings, as an improvement upon the present method of collection and distribution; and he hopes, despite the excellent reasons given by Prof. Maisch for resigning the duties of Secretary, that he will continue his services.

In reference to the law suggested last year, he believes further and more definite action is needed. In reference to the distribution of the Proceedings gratuitously, that more care be necessary in complimentary presentation; that the Association should not wait for invitations in deciding on the places of meeting, and that the Local Secretary should, if necessary, provide needful accommodations at the expense of the Association.

The President calls attention to the sparsity of Southern members, and, after making full allowance for the influence of the war and interruption of business, he considers the 45 members from the 13 Southern States as far too small compared with the number of excellent apothecaries in Southern cities, and he attributes it to the fact that the Association has never met there and excited an interest, and suggests that it should do so.

The President, in speaking of the relations of pharmacutists with physicians, thinks that the influence of educated and skilled physicians in demanding honesty, carefulness and thorough education on the part of druggists, would be a great step towards

furthering the aims of this Association in promoting a desire among apothecaries for a higher professional standing, based on thorough qualification.

He alludes to the fact that several medical schools have undertaken to teach and graduate young men in Pharmacy, without a sufficient experience, or perhaps no experience, in the shop, thus leaving out the very foundation of the edifice of pharmaceutical education, and unsettling the value of the Diploma.

"If Universities are to confer degrees in Pharmacy without requiring the necessary qualifications, or if they are to be their own judge of what constitutes qualification, the teachers themselves being ignorant of what should be required, then it is time for earnest work on our part, and for the establishment by law of what an apothecary shall know and be capable of doing."

The President, alluding to the national jubilee proposed to commemorate the Centennial Anniversary of our Nation's Birth, advocates the suggestion of Prof. Maisch, that an international congress of pharmacutists be held in Philadelphia in 1876, about that time.

In conclusion, judging from the good fruits yielded to the North-west from the meeting in Chicago, he thinks a meeting in New Orleans and in San Francisco will have a most beneficent influence, uniting all in a common purpose for a common good. Our rapidly increasing numbers and intellectual resources, directed to investigation and stimulating education and a love of knowledge, gives promise of a bright and useful future. Great work requires great effort, and whilst anticipating the exertion of the members, the President cheerfully promises his co-operation.]

The address was listened to with marked attention, and, on motion of a member, was referred to a Committee of five, consisting of Samuel M. Colcord, Isaac Coddington, John J. Thompson, Charles A. Heinitsh and James T. Shinn.

The meeting then adjourned to 9 o'clock to-morrow morning.

Second Session—Wednesday Morning, Sept. 14th.

The meeting was called to order by the President at 9 o'clock. The Secretary read the minutes, which were adopted. The Sec-

retary then stated that early last evening he had sent the following message by the Atlantic cable :

"Pharmaceutical Conference, Liverpool ;

"Fraternal greeting of American Pharmaceutical Association.

"MAISCH, Secretary."

Last evening, between 9 and 10 o'clock, President Sargent received the following message :

"To President of American Pharm. Association, Baltimore :

"The most successful meeting ever held sends hearty fraternal greeting.

PRESIDENT BRITISH PHARM. CONFERENCE."

The Secretary also read the following telegram, directed to him as Secretary :

"City of Fort Wayne presents compliments, and desires to state that she will be at home during month of September, 1871.

"H. V. SWERINGEN."

The Business Committee offered the following :

Resolved, That the Faculty of the University of Maryland, the Faculty of the Washington Medical College, and the Medical profession generally, be invited to be present at the sessions of the Association.

The Treasurer read his report. [We have not seen this.]

The Chair appointed the following Committee to audit the accounts : Samuel M. Colcord, of Boston, Thomas Whitfield, of Chicago, and W. A. Perkins of San Francisco.

The Nominating Committee presented the following report :

For President,

RICHARD H. STABLER, Virginia.

First Vice-President,

FLEMING G. GRIEVE, Georgia.

Second Vice-President,

JAMES G. STEELE, California.

Third Vice-President,

EUGENE L. MASSOT, Missouri.

Treasurer,

CHARLES A. TUFTS, New Hampshire.

Permanent Secretary.

JOHN M. MAISCH, Pennsylvania.

Local Secretary,

(To be filled at last session).

Executive Committee,

THOMAS S. WIEGAND, Chairman,	. . .	Pennsylvania.
MATTHEW F. ASH,	. . . . .	Mississippi.
ALPHAËUS P. SHARP,	. . . . .	Maryland.
CHARLES H. DALRYMPLE,	. . . . .	New Jersey,

*Permanent Secretary ex officio.**Committee on Progress of Pharmacy,*

WILLIAM T. WENZELL, Chairman,	. . .	California.
THOMAS J. GREATREX,	. . . . .	California.
WILLIAM SAUNDERS,	. . . . .	Canada West.
LOUIS DOHME,	. . . . .	Maryland,

*Local Secretary ex officio.**Committee on the Drug Market,*

JOHN MCKESSON, JR., Chairman,	. . .	New York.
WILLIAM GEARY,	. . . . .	California.
JOHN J. THOMSEN,	. . . . .	Maryland.
RICHARD M. SHOEMAKER,	. . . . .	Pennsylvania.
FREDERICK A. KEFFER,	. . . . .	Louisiana.

Committee on Scientific Queries,

ALBERT E. EBERT, Chairman,	. . . . .	Illinois.
C. LEWIS DIEHL,	. . . . .	Kentucky.
WILLIAM PROCTER, JR.,	. . . . .	Pennsylvania.

Business Committee,

ALFRED B. TAYLOR, Chairman,	. . . . .	Pennsylvania.
E. H. SARGENT,	. . . . .	Illinois.
JAMES T. SHINN,	. . . . .	Pennsylvania.

On motion of the Business Committee, a ballot was ordered for the Presidential nominee, and Messrs. Whitfield and Wenzell were appointed tellers, who reported the election unanimous.

Pending the action of the tellers, the Secretary read an invitation to the Association, from Messrs. Gail and Ax, to visit their tobacco manufactory, 28 Barre street.

The invitation was accepted, and the thanks of the Association returned.

The Business Committee moved that the President be authorized to deposit an affirmative vote for the remaining candidates, which being done they were declared duly elected.

The President now appointed Messrs. Procter and Colcord to conduct the President elect to the chair, when the President arose and introduced Dr. Richard H. Stabler to the meeting, who then made a few appropriate remarks.

The Secretary read the introduction to the report of the Committee on the Progress of Pharmacy, which with the report was referred to the Executive Committee.

The Secretary read the Report on the Constitution and By-Laws, which was accepted. Various suggestions being made, it was ordered that the report be recommitted to the Committee, who were to receive the suggestions of the members in writing, and report at a future sitting.

The report of the Secretary on Legislation was read and accepted.

It was moved and adopted that the Laws on Pharmacy be printed in the Proceedings, and that the other suggestions contained in the report be referred to the Committee on the President's Address.

It was, on motion, ordered that Dr. Squibb have the floor at 12 o'clock to-morrow to read papers and exhibit specimens.

On motion, a Committee of three was appointed to consider the time and place of next meeting, to which service the President appointed Henry Haviland of New York, Thomas Whitfield of Chicago, and Fleming G. Grieve of Georgia.

On motion of the Business Committee, a Committee of Three was appointed by the Chair, consisting of William S. Thompson of Baltimore, William T. Wenzell of San Francisco, and G. F. H. Markoe of Boston.

Albert E. Ebert read the report of the Committee on Queries, which, being approved, was referred for publication :

The Committee on Queries report the following list for the ensuing year, with the names of those who have accepted them for examination.

ALBERT E. EBERT, *Chairman.*

1. Are the preparations of rennet identical with those of pepsin, and can the former be prepared only from the fourth stomach of the calf?

Accepted by Clemmons Parrish, Philadelphia.

2. How may camphor be reduced to a fine powder, and retained in a pulverulent condition?

Accepted by John C. Lowd, of Boston, Mass.

3. On examination of the meat extracts of commerce, what is the actual

nutritive value of the preparations, and how do they compare one with another? *Accepted by Albert E. Ebert, of Chicago.*

4. What proportion of mercury is contained in the blue pill of the market? *Accepted by Charles H. Bassett, of Boston.*

5. What is the quality of bees' wax in the market, and what are the best means of detecting its adulterations?

Accepted by John J. Thomsen, of Baltimore.

6. To what does poke root (*Phytolaccæ Radix*) owe its activity? Can the active principles be isolated?

Accepted by J. F. Hancock, Baltimore.

7. Ammonio citrate of bismuth loses its solubility to a great extent by age. Can any other salt of bismuth replace this in the desirable quality of solubility, and at the same time be more stable in composition?

Accepted by Prof. Geo. F. H. Markoe, of Boston.

8. To what extent are the essential oils adulterated or sophisticated? How may impurities be detected?

Accepted by William S. Thompson, of Baltimore.

9. Glycerin of various grades is furnished by the manufacturers. In what respect do they differ? What are the usual impurities of glycerin, and what are the best practical tests?

Accepted by Joseph P. Remington, of Philadelphia, Pa.

10. What is the best practical method for making suppositories extemporaneously?

Accepted by R. B. Ferguson, Washington, D. C.

11. Is a liquid preparation of hydrate of chloral desirable? If so, what is the best vehicle to preserve it from change and render it agreeable for administration? *Accepted by Prof. Geo. F. H. Markoe, of Boston.*

12. Pancreatic juice has been highly recommended to assist the assimilation of fat in the human stomach. In what manner is the fluid obtained, and what permanent preparations of it can be made that will be suitable for administration?

Accepted by J. F. Hancock of Baltimore, Md.

13. To what extent are the oils of pea nuts, cotton seed, mustard seed or of other seed sold for olive oil? and how can they be readily detected when so substituted?

Accepted by Henry N. Rittenhouse, of Philadelphia.

14. What is the active principle of wahoo bark (*Enonymus atropurpureus*)?

Accepted by Charles E. Dohme, of Baltimore.

15. Are the California wines and brandies suitable for medicinal use? Are the wines and brandies now supplied to the Atlantic cities from California as good as can be obtained from that source?

Accepted by William Searby, of San Francisco.

16. What system of apprenticeship is best adapted to this country? What amount of preliminary education should be required of such ap-

prentices, and what means should be employed to render their apprenticeship profitable to themselves and satisfactory to their preceptors?

Accepted by Samuel M. Colcord, of Boston.

17. What quantity of castor oil is produced annually in the United States, and to what extent is the American oil put up in packages and sold in imitation of the East India oil?

Referred to Francis X. Crawley, of St. Louis, Mo.

18. To what extent may traffic in fancy goods, liquors and cigars be regarded as compatible with legitimate pharmacy?

Accepted by Samuel Campbell, of Philadelphia.

19. Tincture of blood root deposits a sediment on standing. Is the activity of the preparation thereby impaired, and is there a more suitable alcoholic strength for this tincture?

Accepted by Louis Dohme, of Baltimore.

20. Does the commercial subcarbonate of iron of the market conform to the requirements of the United States Pharmacopœia? If not, in what respect does it differ?

Accepted by P. W. Bedford, of New York City.

21. Granulated effervescing compounds are sold by druggists under popular names, and the demand for them is constantly increasing. Yet these compounds are known to be different from the preparations represented by the labels. Give a practical process for the preparation of such as are believed to possess merit.

Accepted by Samuel Campbell, of Philadelphia.

22. Is tincture of opium as usually dispensed uniform in morphia strength? What range is covered by the differences existing in samples obtained from reputable sources?

Accepted by L. M. Rice, of New York City.

23. What are the best containers, or what other precautions can be devised for poisonous drugs to lessen the liability to mistakes in dispensing or handling them? *Accepted by William C. Bakes, of Philadelphia.*

24. The purity of commercial tartar emetic has been questioned. To what extent, if at all, is the article impaired, and in what respect does it usually fail to conform to the official standard?

Accepted by Joseph P. Remington, of Philadelphia.

25. What medicinal articles are in popular use among the Indian tribes, and what properties are ascribed to such as are unknown to our commentaries?

For general acceptance.

26. Is there a practicable and cheap process for isolating cantharidin? and in what proportion should it be substituted for cantharides in the various vesicating preparations?

Accepted by Albert E. Ebert, of Chicago.

27. An article has been introduced into the market under the name of African Saffron. What is its source and botanical history?

Accepted by John M. Maisch of Philadelphia.

28. Spirit of nitrous ether varies greatly as obtained from different manufacturers. By what practical process may the proportion of nitrous ether in the spirit be estimated, and is the alcoholic strength of the U. S. Pharmacopœia a proper one? *Accepted by F. Mahla, of Chicago.*

29. The aromatic sulphuric acid of the United States Pharmacopœia is objectionable in that it deposits upon standing, and when diluted with water, resinous and coloring matter separates. How can the formula be modified to overcome these objections?

Accepted by Thomas Doliber, of Boston.

30. Medicated and aromatic waters, prepared by rubbing essential oils with carbonate of magnesia, are found to contain soluble salts derived from the magnesia. What substance can be substituted for the magnesia that will furnish a water free from foreign matter?

Accepted by S. A. D. Shepard, of Boston, Mass.

31. What proportion of magnesia is contained in the solution of citrate of magnesia as obtained from different sources, and how do these solutions differ from the official?

Accepted by Prof. Geo. F. H. Markoe of Boston, Mass.

32. In what respect does deodorized tincture of opium differ from the elixirs of opium in the market? The former prepared by the U. S. Pharm. process gradually deposits a dark colored sediment. Are any of the active principles thrown down in connection with the deposit?

Accepted by Charles E. Dohme, of Baltimore, Md.

33. What is the comparative value of carbolic acid and other disinfectants and antiseptics? Which is the best disinfectant for general use?

Accepted by Edward C. Jones, of Philadelphia.

34. Prof. Wormly has isolated two active principles from yellow jasmin (*Gelsemium sempervirens*), one of which he calls gelsemine, and the other gelseminic acid. How may these principles be isolated in quantity? What is the antidote to the poisonous effects of this drug?

Accepted by Joseph M. Hirsh, of Chicago.

35. Is the ordinary commercial alcohol of the market sufficiently free from fusel or grain oil for pharmaceutical use?

Accepted by N. Pierpoint, of Young America, Illinois.

36. It is found that ordinary menstrua do not hold polygalic acid of senega in solution, and that well made fluid extracts of senega from good specimens of the drug are liable to gelatinize in cold weather. What menstruum is best adapted for holding all the active principles of senega in permanent solution, and excluding pectin and other useless substances?

Accepted by H. N. Rittenhouse, of Philadelphia.

37. What is the best formula for solution of citrate of magnesia? Can a permanent solution of it be made?

Accepted by E. H. Sargent, of Chicago.

W. S. Thompson was excused from serving on the Committee on Specimens, and Ferris Bringham appointed in his place.

The business involved in the 1st resolution laying over from last year, at page 87 of the Proceedings for 1869, was referred, for consideration, to the Committee on By-Laws and Constitution.

Albert E. Ebert referred to the fact that the Committee on Unofficial Formulas had failed to report for several years.

After some discussion of the matter Dr. Squibb moved that hereafter this Committee consist of but one member, which being adopted, the Chair appointed J. Faris Moore.

The reading of queries being called for, they were called in the order of their numbering, but owing partly to the members not expecting this arrangement, but few were prepared, having left their papers at their lodgings.

The Secretary stated that Dr. S. S. Garrigues, having been absent from home a large part of the year, had not been able to pursue the experiments necessary to a reply, and desired the subject continued.

Joseph L. Lemberger made some verbal remarks on query 13 and requested its continuance to him.

Albert E. Ebert gave as a reason for not replying to query 19 that he was quite unable to find any true *gillenia trifoliata* in the market. It was suggested that the root of *gillenia stipulacea* may be procured, which is a western plant of similar properties, which Mr. Ebert accepted.

The Auditing Committee made the following report, which was adopted:

"The Committee appointed at the 18th Annual Meeting to examine the accounts of the Treasurer for the past year respectfully report that they have carefully examined the accounts and vouchers thereto pertaining, and have found the same to be correct. They are happy to congratulate the Association on having its financial affairs in the hands of so faithful and able an officer."

Signed	S. M. COLCORD,	} Committee.
	THOMAS WHITFIELD,	
	W. A. PERKINS.	

The Treasurer's Report was then, on motion, adopted.

A volunteer paper by Joseph P. Remington, of Phila., on glycerin, was read by Albert E. Ebert, which was accepted and referred.

The valuable suggestions of this paper called forth some discussion.

The Executive Committee presented the names of the twenty-one applicants for membership. A ballot was ordered, Messrs. Lemberger and Hall were appointed tellers, who reported the unanimous election of the candidates, as follows :

John Calvert, San Francisco, Cal.	Robt. Lautenbach, M.D., Balt., Md.
Emlen Painter, " "	Richard Sappington, M.D., " "
William Geary, " "	Philemon S. Reed, Phila., Penn.
John W. Moffit, " "	Ransford W. Vandervoort, New-
James Frost, Vallejo, " "	ark, N. J.
Wm. Simpson, San Francisco, " "	Wm. M. Littell, Newark, N. J.
Edward J. Richards, Haywards " "	Charles Rice, New York City.
Alfred W. Test, Camden, N. J.	Albert P. Brown, Camden, N. J.
Elijah Button, Annapolis, Md.	Thomas H. Hazard, Richmond, Va.
John W. German, Balt., " "	M. Smith Hawkins, Salem, Ohio.
Thomas, Starr, New York.	Henry A. Suding, Baltimore Md.

On motion, it was ordered that when this session adjourns it shall be to meet at 3½ o'clock this afternoon.

S. Mason McCollin made some verbal remarks on query No. 12, on pepsin, stating some of the difficulties he had had and requesting its continuance to him for another year.

Secretary Maisch read a paper by S. P. Duffield, Ph.D., of Detroit, on aconite poisoning, which was accepted for publication. Then adjourned.

Third Session.

The meeting was called to order by the President, and the minutes read by the Secretary and adopted.

James T. Shinn read a reply to query No. 7, on liquid preparations of Guaiac Resin, which was referred for publication.

Query No. 10 was continued to Edward C. Jones, he having failed to answer owing to sickness.

W. Procter, Jr., replied to query 25, on the Morphiometrical Assay of Opium, which was referred, and also a partial reply to query 26, on *Abies Canadensis*.

Charles L. Eberle made some verbal remarks on suppositories,

which elicited considerable discussion in reference to the influence of wax and other additions to butter of cacao on its fusing point.

Benj. F. Stacy read an essay on the honey trade in reply to query No. 20; referred for publication.

S. M. Colcord, Chairman of the Committee on the Constitution and By-Laws, having moved and carried to make certain verbal alterations, the Business Committee moved that the Constitution and By-Laws, as now presented by the Committee, be adopted, which was agreed to.

In view of the failure of so many reports the Business Committee offered the following resolution, which was passed :

Resolved, That this Association views with regret the neglect on the part of Chairmen of Committees to furnish reports; as also the failure of members to answer queries accepted by them, and hereby expresses its disapprobation of such neglect.

The Secretary read a volunteer paper by James M. Caldwell, of Philadelphia, in relation to the propriety of taking measures to secure a larger membership in the Southern States, which was referred to the Executive Committee.

A resolution was passed inviting the Faculties of the University of Maryland and the Washington Medical College to attend the meetings of the Association.

The Convention then adjourned till to-morrow morning at 10½ o'clock.

Fourth Session.—Thursday morning, Sept. 15th.

President Stabler called the meeting to order at 11 o'clock, when the Secretary read the minutes of 3d session, which were adopted.

Charles L. Eberle read a paper on Suppositories, in reply to query No. 29.

Secretary Maisch read a paper by C. L. Diehl, of Louisville, on indigenous drugs in reply to query 27, which was referred for publication.

William J. M. Gordon, in a letter read by the Secretary, stated that he had not been able to reply to query No. 11, but believed by another meeting he would be able to make a satisfactory report. The subject was continued to Mr. Gordon.

Dr. Wilson H. Pile read a paper on Baumé's hydrometer, illustrated by diagrams and experiments; referred for publication.

Dr. Squibb now proceeded to read his paper on Rhubarb root, which he illustrated with two entire cases of that drug, of unusually good quality.

Dr. Squibb also read a paper on Fluid Extracts and their Menstrua, in which the results of accurate experiments in repercolation are detailed, both of which were referred for publication.

The Chairman of the Business Committee offered the following resolutions, which were unanimously adopted:

Resolved, That the members of the Association tender their warmest thanks to Messrs. Gail and Ax for the courteous attention and hospitality extended to them at their mammoth tobacco works on the occasion of a visit by special invitation.

Resolved, That the thanks of the visiting members of the American Pharmaceutical Association in attendance at the Eighteenth Annual Meeting, are hereby tendered to the pharmacutists of Baltimore and their friends, especially the Reception Committee and the Local Secretary, for their endeavors to render our stay in "the Monumental City" pleasant and social. They will return to their homes with pleasant remembrances of their visit.

Resolved, That the thanks of the members of the American Pharmaceutical Association are hereby tendered to Messrs. Thomas Kensett & Co., of Baltimore, for the courtesy extended on the occasion of a visit to their extensive [fruit canning] works.

Resolved, That the thanks of the members of the Association are hereby tendered to Messrs. Maltby & Co., of Baltimore, for the courtesy extended on the occasion of a visit to their extensive oyster [canning and shell lime burning] establishment.

Resolved, That the sincere thanks of this Association are eminently due and are hereby tendered to the Faculty of the University of Maryland for the free use of their (Lecture) Hall for the purposes of the Eighteenth Annual Meeting of this Body.

The following report was then read and laid on the table for publication:

The Committee appointed to consider the time and place for holding the next annual meeting respectfully report that our next annual meeting take place at St. Louis, Missouri, on the second Tuesday in September, 1871, at three o'clock P. M.

(Signed)

HENRY HAVILAND, Chairman.

The meeting then adjourned to meet at 3½ o'clock this afternoon.

Fifth Session.

The meeting was called to order by President Stabler at 3½ o'clock P. M. The Secretary read the minutes of the fourth session.

Mr. M. F. Ash, on behalf of the Executive Committee, presented the following list of candidates for membership:

E. C. Lewis, Rutland, Vermont.	John M. Lloyd, Cincinnati, Ohio.
Albert W. Higgins, “	Carlos E. Day, Brooklyn, N. Y.
Wm. H. Osborn, Baltimore, Md.	J. B. H. Campbell, Cumberland, Md.
J. Newport Potts, “	J. Addison Sheets, Baltimore, “
Henry C. Holden, N. Adams, Mass.	H. W. Cady, Plattsburgh, N. Y.
Isaac H. Kay, Philadelphia, Pa.	Adam J. Gosman, Baltimore, Md.
E. H. Luckenbach, Bethlehem, Pa.	William Vincent, Brooklyn, N. Y.
Joseph Josselyn Estes, E. Abington, Mass.	Wilbur F. Thompson, Balt., Md.

The President appointed Messrs. Simms and Milburn tellers, who reported the unanimous election of all the candidates.

William Saunders read a paper on some Medicinal Plants of Canada, which was ordered for publication.

The Committee on Queries and Papers brought forward a paper by George S. Dickey, entitled “Practical Notes on the Pharmacopœia.”

It was moved and passed, that this paper be returned to the author with the thanks of the Association, and the request to have it elaborated for publication, if he pleases to offer it.

The report of the Committee on the President's Address, and the Secretary's report on Legislation, were brought forward in the form of a series of resolutions, of which the following were adopted, viz.:

Resolved, That the Executive Committee be directed to furnish the Chairman of the Committee on the Progress of Pharmacy with such journals as he may designate for the compilation of his report.

Resolved, That Joseph P. Remington, Albert E. Ebert, and William T. Wenzell, shall constitute a committee on the adulteration and sophistication of drugs and chemicals for the ensuing year.

Resolved, That, in thankful remembrance of his former service to the Association, Mr. T. S. Wiegand be requested to prepare a general Index

of the Proceedings for the last ten years, to be published in the volume for 1871.

Resolved, That the President be directed to appoint an authorized agent, where needed, in the different States, for the collection of dues, distribution of Proceedings, &c., said agent to be designated by the Treasurer and Permanent Secretary of the Association. A list of the agents to be published in the Proceedings.

Resolved, That a committee be appointed to take into consideration the suggestion to invite the International Congress of Pharmaceutists to meet in the United States in 1876, and report upon it in 1871.

Resolved, That a committee of five be appointed to report upon Legislative action upon Pharmacy and the drug trade in the different States of the Union.

Dr. Frederick Hoffman moved, "That a committee of three be appointed to draft an address of felicitation, embodying the kind sentiments of this Association on the occasion of the 50th anniversary of the North German Apothecaries' Association, and to forward this address in the name of the Association to the Permanent President, Mr. William Dankwortt, in Magdeburg."

This motion was carried, and Messrs. Hoffman, Maisch and Sargent appointed to carry it into effect.

Dr. Squibb moved that the 19th annual meeting be held at the place and time recommended by the Committee in the report read at the fourth session, which was carried.

Mr. Whitfield nominated Wm. H. Crawford, of St. Louis, for Local Secretary, and his election was carried.

Ferris Bringhurst read the report of Committee on Specimens, which was accepted and the Committee discharged.

Dr. Squibb, at the request of the Association, explained the process for making chloral hydrate, the properties of this compound, and its impurities, which was listened to with marked interest.

The President announced the following Committees, viz.:

As the Committee on Legislation, John M. Maisch, Secretary; Ezekiel H. Sargent, of Illinois; Robert S. McMurdy, of Albany, N. Y.; Henry J. Menninger, of Raleigh, N. C.; Matthew F. Ash, Jackson, Miss.

As the Committee to report on the practicability of inviting the International Congress of Apothecaries to meet in the U. S. in 1876, William Procter, Jr., Albert E. Ebert, and Dr. F. Hoffman.

The Executive Committee presented the name of Mr. J. B. Duble, of Williamsport, Penn., for membership.

On motion, an affirmative ballot was deposited by the President for the candidate, and he was declared duly elected.

Mr. W. T. Wenzell read a paper on Pharmacy in California, which was referred to the Executive Committee.

Dr. Squibb moved that when we adjourn, we adjourn to meet in St. Louis next year, as provided for.

The thanks of the Association were given to the retiring officers, and the minutes read, when the meeting adjourned.

MINUTES OF THE CONVENTION OF DELEGATES FROM
COLLEGES AND SOCIETIES OF PHARMACY, HELD IN
BALTIMORE ON THE 14TH AND 15TH OF SEPTEMBER,
RELATIVE TO PHARMACEUTICAL EDUCATION.

At a meeting of Delegates from Colleges of Pharmacy and Pharmaceutical Associations, held, in pursuance of the call of Maryland College of Pharmacy, in the hall of the College, on the evening of September the 14th, 1870,

On motion of Prof. Procter, Mr. Joseph Roberts, of Baltimore, was elected President *pro tem*.

On motion of Mr. Ebert, Mr. Wm. Wright, Jr., was elected Secretary *pro tem*.

On motion, the President appointed Professors Procter and Moore, and Mr. Thos. Whitfield, of Chicago, a Committee on Credentials.

The Delegates from *Maryland College* were Messrs. Joseph Roberts, J. Brown Baxley, and Profs. De Rosset, Claude Baxley, and J. Faris Moore.

From *New York College of Pharmacy*, Messrs. Geo. C. Close, David Hays, P. W. Bedford, Isaac Coddington and Wm. Neergaard.

From *Chicago College of Pharmacy*, Messrs. Albert E. Ebert, Thos. Whitfield, E. H. Sargent, N. Pierpoint and Dr. F. Mahla.

From *California Pharmaceutical Association*, Mr. W. T. Wenzell.

From *Philadelphia College of Pharmacy*, Professors Procter and Maisch, Messrs. A. B. Taylor, Henry N. Rittenhouse and Dr. Wilson H. Pile.

From *New Jersey Pharmaceutical Association*, Messrs. Randall Rickey of Trenton, Julius Fehr of Hoboken, Edward F. Kelly of Newark, William Rust of New Brunswick, Joseph De La Cour, Jr., of Camden.

From *Massachusetts College of Pharmacy*, Prof. Geo. F. H. Markoe, and Messrs. Chas. A. Tufts and Samuel M. Colcord.

The Secretary read the call issued by the Maryland College of Pharmacy April 21st, 1870.

On motion, it was resolved that each delegation nominate one of its members to form a Committee to nominate permanent officers. This Committee consisted of Mr. E. H. Sargent of Chicago, Mr. G. C. Close of New York, Prof. G. F. Markoe of Boston, Prof. J. Faris Moore of Baltimore, Mr. Julius Fehr of Hoboken, N. J., Mr. W. T. Wenzell of San Francisco, Mr. A. B. Taylor of Philadelphia.

On motion, resolved that the permanent officers consist of a President and a Secretary.

The Nominating Committee then proposed for President Mr. Joseph Roberts, of Baltimore; for Secretary, Prof. J. Faris Moore—who were unanimously elected.

The discussion commenced by the President stating the object for which the meeting was called, which was embraced in the following questions, which were read:

Shall there be an educational standard established, to be verified by an examination exacted from all proposing to learn the profession of Pharmacy?

If so, what shall that standard be?

Shall said examination be had prior to receiving the apprentice by his preceptor, or prior to receiving him as a student in a College of Pharmacy?

What term and style of apprenticeship shall be exacted?

What branches taught, what text-books used, and what form of examination adopted, that there may be an uniform standard for all graduating in Pharmacy?

Shall there be an uniform scale of fees?

¶ Shall any diploma be recognized that is not based upon a regular apprenticeship as an apothecary?

Prof. Procter inquired if the final action of this Convention was to be recommended to the several bodies for their adoption, and subject to their action thereon.

The President replied that such was understood to be the intent of this Convention.

¶ On motion, it was resolved that the queries prepared by the Committee of the Maryland College of Pharmacy should be taken up seriatim.

The first query, "Shall there be an educational standard established, to be verified by an examination exacted from all proposing to learn the profession of Pharmacy?" was then taken up.

Mr. Taylor offered the following substitute:

Resolved, That there be an educational standard established prior to the admission of any student to attendance on the lectures of Colleges of Pharmacy.

Prof. Procter offered the following amendment, which was carried:

Resolved, That, in the opinion of this Convention, more attention to the preliminary education of those who propose to enter the business of pharmacutists is needed, and it is earnestly recommended to the Colleges and Societies of Pharmacy to urge their members and the profession of the United States generally to give greater care to this subject in taking apprentices.

Mr. Sargent moved that a term of service of four years in a dispensing drug store be recommended to be exacted from students in Pharmacy before coming up for final examination. Carried.

Resolved, That we recommend that apprentices shall not be taken under sixteen years of age, and shall be twenty-one years of age before being entitled to receive their diploma.

Carried.

On motion of Mr. Sargent, a Committee was appointed to take into consideration the propriety of making this a permanent organization, to hold its meetings at the same time and place as the meetings of the American Pharmaceutical Association. Carried.

Prof. Procter suggested to the Committee that Pharmaceutical societies be included in the organization, even although not actually teaching Pharmacy.

On motion of Mr. Bedford, it was resolved, that when this meeting adjourns, it adjourn to meet at the close of the second session, to-morrow, of the American Pharmaceutical Association, providing there is time, and if not, to meet here in the evening, at 7½ o'clock.

The meeting then adjourned.

WM. WRIGHT, JR.,
Secretary *pro tem*.

The adjourned meeting, on the evening of Thursday, Sept. 15th, 1870, was called to order by the President, Mr. Roberts. The minutes of the adjourned meeting were then read, and, on motion of Prof. Moore, Dr. Squibb was added to the New York Delegation, and, on motion of Mr. Hays, Mr. E. L. Milhau was also added to the same delegation.

On motion of Prof. Moore, the question, "What branches shall be taught?" was discussed.

Moved and seconded that Dr. Hoffman, of New York, and Dr. R. H. Stabler, of Alexandria, Va., be invited to a seat and to take part in the discussions. Carried.

The following resolution was then, after much discussion, carried:

Resolved, That the branches to be taught in Colleges of Pharmacy should at least include lectures on general chemistry, elementary botany, materia medica, and the general facts and principles of Pharmacy, and, when practicable, opportunity should also be provided for instruction in practical and analytical chemistry.

A discussion then ensued on the subject of "Text-books to be used," which, though long and interesting, ended in the subject being passed by.

It was then considered what form of examination shall be recommended to be adopted, that there may be an uniform standard for all graduates in Pharmacy, which resulted in the following being offered by Prof. De Rosset:

Resolved, That it is inexpedient at this time to recommend any uniformity in conducting examinations for graduation, but it is earnestly recom-

mended that whatever method be adopted should include questions both oral and written, and that particularly a familiarity with the physical properties of specimens should be insisted on.

Which was amended by Mr. Milhau moving the striking out of the first twenty words, leaving the resolution as follows :

Resolved, That it is earnestly recommended that whatever method be adopted should include questions both oral and written, and that particularly a familiarity with the physical properties of specimens should be insisted on.

In which shape the resolution was carried.

On motion of Prof. Procter, it was resolved that diplomas should not be recognised as evidence of sufficient qualification, unless based on four years' practical service in a dispensing shop.

On motion of Mr. Sargent, it was resolved that each College of Pharmacy be requested to take action on the questions presented at this Convention, and report to this body at its next meeting.

PHARMACEUTICAL NOTES.

MR. EDITOR :

Dear Sir,—The following may, perhaps, be found worthy a place in your journal :

Syrupus Tolutanus.

I have been using for some time the following way to make this syrup, and get a preparation with a stronger flavor than that made according to the U. S. Pharmacopœia.

I first make a syrup with 26 troyounces sugar and one pint water ; then I take a well annealed bottle (sufficiently large) into which I put 2 drachms magnesia carbonate and 2 fluidounces tinct. tolu ; shake well, add the boiling hot syrup, shake for a couple of minutes, and throw the mixture, hot as it is, on a paper filter. Of course, the funnel is covered with oiled silk, a glass plate, or other cover.

There are two objections to be made :

1st. The above method can only be followed at the imminent risk of bottles and funnel. If the bottles and funnel be rinsed

out with hot water previous to using them, the risk is lessened considerably.

2d. Syrups filter very slowly. The hotter the syrup is, the quicker it runs through; a ribbed funnel or, better, interposing small sticks of wood or glass rods between the filter and the funnel quickens filtration a good deal.

Syrupus Zingiberis

I prepare in the same way, that is to say, I substitute $1\frac{1}{2}$ fluid-ounce fluid extract of ginger for 6 fluidounces tincture of ginger (both representing the same quantity of rad. zingiber). Of course, I follow the proportions of the Pharmacopœia.

Camphoræ Pulv.

Camphor is easily enough reduced to powder by rubbing with a few drops of alcohol, but after a short time the powder will aggregate to crystals, which have to be rubbed down again.

I reduce camphor to a fine powder as above, but mix it then intimately with carbonate of magnesia (10 grains to the ounce is sufficient, but even 20 grains can do no harm). This powder never cakes or forms crystals.*

H. M. W.

Philadelphia, Sept. 17, 1870.

TARTAR EMETIC—AN ANTHELMINTIC.

BY J. DABNEY PALMER, M. D.

My attention was directed to this property of tartar emetic by observing the discharge of worms in several cases in which the medicine had been employed for other indications. It is calculated to expel the round worm as effectually as the tape.

* [The idea of using carbonate of magnesia to prevent the coalescing of camphor powder was suggested several years ago by the late Henry F. Fish, in a paper read at the New York meeting of the Association. (See volume for 1860.) In his process, a drachm of the magnesium carbonate was used to disintegrate 16 ounces of camphor, by dissolving the latter in alcohol and pouring the solution into a gallon of water in which the magnesia was suspended, and letting the whole settle and collect in a filter.—EDITOR.]

A little girl of 5 years was threatened with inflammation of the brain, for which two or three doses of the antimonial were administered. After taking the last dose she passed a large round worm, and, as no anthelmintics had been given, the result was ascribed to the antimonial.

Mrs. M. gave her child hive syrup, and, in order to induce the child to take it, she took some herself, which was followed by the discharge of 18 inches of tape worm.

These worms were passed alive, owing, in all probability, to the minute quantity of tartar emetic taken.

Monticello, Florida, Oct. 1, 1870.

CHALK MIXTURE.

To the Editor :

Seeing several formulas for making chalk mixture in the *Journal*, I will give you one I have been using for two years past, and am well satisfied with :

R. Cretæ Praep., . . . one troyounce.
 Sacchari,
 Pulv. G. Acaciæ, . . . each one-half troyounce.
 Ol. Cinnamomi, . . . fifteen drops.

Mix in the usual manner [with a pint of water].

Respectfully, WILLIAM H. ROBINSON.
Pottsville, Sept. 13, 1870.

CRYSTALLIZATION OF SULPHO-CARBOLATE OF QUINIA.

By C. J. RADEMAKER, M. D.

Having had occasion to prepare sulpho-carbolate of quinia, for hospital use in this city, the following process was resorted to :

Crude sulphocarbolic acid was saturated with plumbic carbonate, the sulphocarbolate of lead crystallized, and decomposed with sulphate of quinine. The solution of sulphocarbolate of quinine filtered and evaporated, but it was found almost impossible to crystallize the salt, owing to the gelatinous condition of

part of the solution, which adhered to the small amount of crystals formed. The gelatinous mass was redissolved in alcohol and set aside to evaporate spontaneously, with the same result, it being found impossible to remove the crystals with any degree of nicety from the gelatinous mass.

I then made a solution of sulphocarbolate of quinine of definite strength, a teaspoonful of the solution representing 2 grains of the crystallized salt, or as near 2 grains as I could calculate from the amount of substance used. The liquid was composed of three parts water and 1 part alcohol, and set aside for prescription use. In about 4 or 5 weeks I noticed small crystals forming, which gradually increased in size, the large crystals resembling those of perchloride of iron. Under the microscope they made a beautiful prismatic appearance, but to what system of prisms they belonged I was unable to determine. Part of the crystals were taken out of the bottle and examined, and found to be sulphocarbolate of quinine.

In about two months about one-third of the salt had crystallized out of the solution. The salt was freely soluble in water, but slightly soluble in alcohol, and not deliquescent.

Louisville, Oct. 6, 1870.

AMOUNT OF ARSENIC IN PHOSPHORUS OF COMMERCE.

By C. J. RADEMAKER, M. D.

Frequently preparing dilute phosphoric acid according to the process of the U. S. P., I always pass a current of sulphydric acid through the solution, in order to free it from all substances precipitable by that agent in acid solutions, and invariably obtain a yellowish precipitate, which upon examination proves to be sulphide of arsenic.

In order to find the amount of arsenic present in a given quantity of phosphorus the following process was resorted to:

One hundred grammes of phosphorus were oxidized with nitric acid, the solution diluted and the arsenic precipitated as a sulphide (AsS_3) by means of sulphydric acid, the solution allowed to rest for 6 days. The precipitated sulphide of arsenic was collected on a filter and washed, transferred to a small evaporat-

ing dish and oxidized with nitric acid, and reduced by means of sulphurous acid to arsenious acid, and precipitated in the form of AsS_3 , by means of sulphydric acid; the precipitate digested with ammonia, in order to free it from the small amount of sulphur present, the solution filtered from the undissolved matter, and evaporated, dried and weighed, and found to weigh 15 grains, or nearly one gramme.

Louisville, Oct. 6, 1870.

ON SULPHO-CARBOLATE OF ZINC.

By A. B. LYONS, M. D.

Editor Amer. Journ. Pharmacy:

Dear Sir,—Having had occasion several times to prepare zinc sulphocarbolate, I have adopted the following process as simple, economical, and in every respect satisfactory. A crude sulphocarbolic acid is first prepared in the usual way, by heating together sulphuric and carbolic acids—seventeen parts of the former to sixteen of the latter. This is diluted with ten times its volume of water, and saturated with carbonate of lead. Into the filtered solution of sulphocarbolate of lead is introduced a quantity of pure granulated zinc equal in weight to the carbolic acid employed. At the end of twenty-four hours the solution will usually be found free from lead, giving no precipitate with sulphuric acid or potassium iodide. When quite freed from lead, as indicated by these tests, the solution is decanted, heated to boiling, filtered, and evaporated to a small bulk to crystallize; or the evaporation is carried to complete dryness, the salt being obtained in the granular form. The salt procured in this way is of necessity free from sulphate, and yields fine large colorless crystals without any empyreumatic odor.

Detroit, Mich., Oct. 11, 1870.

NEW FORMULA FOR SYRUP OF CITRIC ACID.

By BENJ. LILLARD, Nashville, Tenn.

This syrup, as prepared in accordance with our National Pharmacopœia, does not always (even when combined with skilful

hands) present a beautiful appearance. And having noticed in a former number of the 'Journal' a request that "each and all contribute something for the Committee of Revision for the next edition of the Pharmacopœia," I have been induced to send an original formula, which yields a prettier and more stable preparation, in less time and with greater ease.

Syrup of Citric Acid.

Take of Citric Acid, in fine powder,	Sixty grains.
Water,	A sufficient quantity.
Syrup,	Sixteen fluidounces.
Spirit of Lemon,	Thirty minims.

Dissolve the citric acid in the water, add the syrup and spirit of lemon, shaking well until they are thoroughly mixed.

When convenient, hot or warm water may be used. I have used the syrup made by this formula for over eighteen months, including two summers in this climate, and have found it to retain its brilliancy and flavor better than when prepared by the old formula.

GLEANINGS FROM FOREIGN JOURNALS.

BY THE EDITOR.

Preparation of Bromide of Sodium. By M. Castel haz. The process which the author finds best is to transform bromine into bromide of ammonium, separating any iodine present, as iodide by crystallization in the mother-liquors, and afterwards decomposing this bromide by an equivalent quantity of carbonate or of caustic soda deprived of sulphate and chloride. The residue of the reaction forms a solution in water which, evaporated hot, deposits little cubical crystals of anhydrous bromide of sodium.

This process, which gives at once bromide exempt from bromate, has the advantage of not losing the bromide in the precipitates from incomplete washing on a large scale. The product is pure at the beginning, and does not require successive crystallizations as when made from iron.

The preparation of bromide of ammonium by means of bromine dropped into a diluted solution of ammonia causes a lively reac-

tion with disengagement of heat, which, added to the production of nitrogen, occasions a loss. But if the operation is performed in a Woulf's apparatus, of earthenware, with an excess of ammonia, the loss of bromine vapor is entirely avoided. The evaporation of the liquors is effected in a cast-iron retort arranged with an earthenware recipient to collect the excess of ammonia. The decomposition of the bromide by carbonate of soda may also be executed on a large scale in cast-iron vessels. —*Journ. de Pharm., Sept., 1870.*

Preparation of Caustic Soda from Sodium. The great reduction in price of sodium enables it to be used for obtaining pure caustic soda, which, thus made, is now an article of commerce. The process is as follows: Into a deep, hemispherical, silver vessel, capable of holding 20 litres ($5\frac{1}{4}$ gallons) introduce a drop of distilled water, and then lay above it a morsel of sodium, about a square centimetre. The silver vessel, which should dip in cool water to prevent an explosion, is then shaken so as to produce contact between the water and sodium, which is transformed to a milky liquid. To this is added, with constant stirring, other fragments of sodium and drops of water until three or four pounds of sodium have been converted into a thick milky liquid. This is deprived of the water it contains by exposure on a gas furnace at a red heat and cast into moulds. —*Journ. de Pharm., Sept., 1870.*

On the influence of Sugar on Magnesia used as an Antidote. In 1846, M. Bussy, and afterwards Christison and others, recommended magnesia as an antidote for arsenic and other metallic poisons. M. Carles, supposing that sugar (as in the case of lime) would, by rendering magnesia soluble, increase its efficacy, tried the mixture of sugar, water and magnesia, but, to his surprise, found that it rendered the arsenite of magnesia soluble, and that sugar tends to prevent the formation of arsenite of magnesia, and is, therefore, useless and pernicious. When, however, saccharated magnesia is used with the salts of lead, copper, antimony and mercury it hastens and facilitates their decomposition without uniting with them, and in some instances the sugar of itself acts by reducing the oxides. For this last reason it may be better to use honey in lieu of sugar.

In conclusion, *except in the case of arsenic*, the association of sugar with magnesia augments the efficacy of the base employed as a general antidote. Two and a half drachms of magnesia, five or six drachms of sugar and three fluid-ounces of water (boiling) appear to be the most convenient proportion.—*Repertoire de Pharmacie*, Aout 1870.

On a new reagent for Alkalies. M. Boettger informs us that the fresh leaves of *Coleus Verschoffelti*, an ornamental plant, are put in a glass bottle and covered with absolute alcohol, containing some drops of sulphuric acid, and macerated twenty-four hours, when the fluid is decanted and other leaves introduced into the same vessel after the exhausted leaves are removed and the liquid returned. The tincture thus obtained is filtered, and is charged with the coloring matter of the leaves, into which strips of paper are introduced and dried in the air.

The test paper thus obtained has a magnificent red color which passes more or less to a fine shade of green by the action of alkalies and alkaline earths. The author considers it better than reddened litmus because more sensitive, and is not modified by carbonic acid, and should be kept close.—*Journ. de Pharm.*, Sept., 1870.

Disinfecting Solution of Carbolic Acid. The Paris authorities, according to the *Journ. de Pharmacie* for August, have furnished gratuitously to poor families, where fatal cases of small pox have occurred, a solution of one part of carbolic acid in 100 parts of water, to bathe the corpse, to prevent infection.

To Camphorate Blisters. M. Deschamps d'Avallon has suggested, when it is desirable to camphorate a blister, it may be readily accomplished by dropping on its surface a few drops of a saturated solution of camphor in chloroform, made by adding two parts of the latter to four of the former.—*Journ. de Pharm.*, Aout, 1870.

New source of Citric Acid. Prof. O. Silvestri, of the University of Catania, has recently observed that the fruit of *Cyphomandra betacea*, one of the Solanææ, growing in the gardens of Sicily, contains a great quantity of citric acid. It is originally from Mexico, and is found in Peru and other parts of South

America, and is called the *tomato of la paz*. This plant is ligneous, attains the height of twelve feet and its fruit yield from one to fifteen per cent. of citric acid. The common tomato also contains citric acid.—*Cosmos, in Journ. de Chim. Méd.*

Honey of Rhatany Root. Treat 300 parts of rhatany with 1000 parts of boiling water to obtain a decoction, strain, add 800 parts of white honey and concentrate until the whole weighs 1200 parts. It is employed as a gargle, 3 parts to make 20 parts of a stringent gargle.—*Rep. de Pharm. and Revue Pharmaceutique.*

Process for Purifying Oils for Manufacturing. The process of M. Keyer, which is applicable to all oils, has given excellent results in a manufactory of rape seed oil. Into 100 kilo-grammes of oil put a mixture of 600 grammes of solution of ammonia and 600 grammes of water, and agitate the barrel well until the alkali is perfectly mixed, which may be done in fifteen minutes. The barrel is then sealed hermetically, and, after three days repose, the oil is decanted and filtered. The residue is used for the manufacture of soap.

Oil thus worked contains no trace of acid, and the mucilaginous impurities are destroyed or precipitated.—*Journ. de Chimie Méd., Aout, 1870.*

Accident in Distilling Ether. In the *Journal de Pharmacie*, for July, M. Regnauld notices the following accident, whereby M. Adrien nearly lost his life. M. Adrian was working in his laboratory, at Courbevoie, when his preparator quitted, for a few minutes, an alembic where he was distilling ether by steam heat. Some moments after he had left M. Adrian observed that the flow of ether was too rapid, and approached the still to moderate the force of steam. He held his hand on the key of the stop-cock, when, all at once, in the middle of the laboratory, he saw a flame, which directed itself towards the condensing vessel. The ether took fire and broke the vessel, the contents burst over the still, which boiled over and threw some boiling inflamo-ether over M. Adrian. During the conflagration which ensued he tried to open a door situated near the apparatus but failed, and was constrained to traverse the flames which hemmed him in to reach an open door beyond. During this perilous act his clothing

ignited, but his presence of mind served him to jump into a tub of water, which probably saved him from death. After a period of great suffering, during which his friends feared grave cerebral complications, he had recovered sufficiently to be out of danger, and to explain the foregoing account of the accident. M. Regnaud asks how an accident of this nature could occur in the laboratory of so prudent and skillful an operator as M. Adrian, so thoroughly acquainted with the properties and dangers of ether? There was no lamp in the laboratory, and the heat was applied by steam. [Probably the accident occurred by the current of ether vapor from neglected refrigeration traversing the floor of the room through the open door to some source of ignition, and then retraced its path to the still. The density of ether vapor will admit of this theory, and the open door would naturally be the direction of the current in a heated room.]

Condurango. The *Repertoire de Pharmacie*, for August, describes this as a contorted, ligneous substance, derived, probably, from a convolvulaceous plant contorted like the *bind weed*. The cortical part is grey externally and yellowish white internally. It has a weak aromatic odor and bitter taste. The wood appears to be constituted of long white fibres; its odor and taste are less decided than the bark. It is said that the seeds of this bind weed are poisonous and simulate the tetanic poisons.

The medical authorities of Equador assert that condurango has rendered them real service, when administered internally by decoction, in cancerous and syphilitic ulcers. This is rendered more probable as the government of Equador has sent a quantity of this drug to be experimented on by French physicians.

Syrup of Iodide of Potassium and Iron (of Lahache).

Take of Iodide of Potassium . . .	308 grains.
Iodide of Iron (in solution 1 to 3) . .	230 “
Orange Flower Water . . .	462 “
Simple Syrup (concentrated) . . .	33½ fluidounces.

Dissolve the iodide of potassium in the orange flower water, add the other solution and incorporate the syrup. Preserve it cool and free from light.—*Union Pharmaceutique.*

GLEANINGS FROM GERMAN JOURNALS.

BY J. M. MAISCH.

Sunstroke.—The *Fremdenblatt* contains a correspondence from a traveller who, on March 23, 1866, was near the Dead Sea with a party of eighteen, one of whom fell from his horse overcome by the excessive heat of 42° R. (126.5° F.) One of the Bedouin guides bathed his hands, head and face with lemon juice, after which the sufferer was able to ride two hours to the banks of the Jordan, where he could rest for several hours, and then completely recovered.—*Ph. Centr. Halle*, 1870, 299.

Resin of Tampico Jalap. *—Prof. H. Spirgatis found it to have properties similar to convolvulin, the resin of true jalap, except that it is readily soluble in ether. This *tampicin*, $C_{34}H_{54}O_{14}$ † under the influence of caustic alkalies is converted into *tampicic acid*, $C_{34}H_{60}O_{17}$ †. Dilute mineral acids convert it into sugar and *tampicolie acid* $C_{16}H_{32}O_3$ †. Tampicin fuses at about 130° C; but even at 100° C (212° F.) it is decomposed, assuming a yellow and finally brown color. It acts similar to convolvulin, but rather uncertain. Moreover, the small amount of resin contained in the tubers, and the large amount of alcohol requisite for its extraction, render it higher in price than convolvulin.—*Buchner's N. Repert.*, 1870, 452—459.

Prize query.—It is very probable that the albuminous bodies of the animal organism, the so-called protein compounds, are to be regarded merely as modifications of the albuminous compounds generated in the vegetable organism. The faculty of the University of Munich desires a compilation of the methods of preparation and of the properties of the animal and vegetable protein compounds (albumen, casein, fibrin,) and a critical sifting and extension of our present knowledge, based upon new researches.

Essays to be handed in on or before April 30, 1871.—*Buchner's N. Rep.*, 1871, No. 8.

* Daniel Hanbury refers the origin of Tampico Jalap to a new species, which he names *Ipomoea simulans*. *Journ. Linn. Soc.* vol ix.

† C=12; O=16.

SOLUBILITY OF GLUE IN GLYCERIN.

BY JOHN M. MAISCH.

Read before the Philadelphia College of Pharmacy, Sept. 18, 1870.

Having recently been called upon as expert to testify in a suit involving the right to manufacture a composition for printing rollers in which sugar is wholly or partially substituted by glycerin, a question propounded to me has led me to make some experiments, which appear to possess some interest to pharmacists and to point to a valuable improvement applicable for technical analysis. The facts of the case, leaving the legal technicalities out of the question, are as follows: A patent was granted in England, on Nov. 24, 1854, to Thomas De la Rue, for a composition of printing rollers, &c., consisting of glue and glycerin. In this patent the glue is *made* by macerating so-called glue pieces, that is, cuttings of hides, skins, &c., in water for several days, after which they are dissolved in glycerin with the aid of heat. This process may be shortened by substituting glue for the glue pieces, and dissolving it in the glycerin. Subsequently a patent was taken out in the United States for similar purposes, the material used being glue, glycerin and sugar. A firm of this city having for some time manufactured such a mixture, a suit was instituted by the patentees in this country to restrain the Philadelphia firm from continuing the manufacture of material for printing rollers with glycerin as an ingredient.

It is well known that glue, and gelatin in general, swells up considerably when kept in cold water; it absorbs water and loses its transparency, and then dissolves very readily in hot water, while the solution is effected slowly if the glue is at once boiled with water without previous maceration, or soaking as it is technically termed. This behavior is so well understood that, even in the kitchen, the gelatin is allowed to soften in cold water before it is boiled to form a jelly.

It is also well known that glycerin is an excellent solvent, capable of dissolving perhaps all compounds which are soluble in water, or in water and alcohol, and many which are soluble in alcohol but not or merely sparingly in water. If this is borne in mind, there is, even at first sight, nothing improbable or un-

reasonable in De la Rue's process, and the writer testified to this effect when questioned on the subject, without having had the time to prove the correctness of his inferences by direct experiment. He also unhesitatingly answered in the affirmative when the question was asked whether he considered glue to be soluble in glycerin; the fact that gum arabic, tragacanth, starch, &c., have in glycerin a behavior very similar to that in water, as far as their solubility is concerned, naturally led to the belief that gelatine would not be an exception. He was therefore greatly surprised when one of the attorneys engaged in the above suit privately informed him that experiments had been made proving that glue was totally insoluble in glycerin, which would even abstract from glue the moisture naturally contained in it. The writer does not know who made the experiments referred to by the legal gentleman, but whoever may have performed them has done so most superficially, entitling his entire results to no credit whatever, unless verified by other more critical experimentists.

Upon the table will be found a number of specimens, the results of my experiments, which I am about to describe, and the reactions of which I shall exhibit to the meeting. The specimens are: (1) white glue macerated with glycerin at a temperature never exceeding 75° F.; (2) white glue digested with glycerin in a waterbath for half an hour, then macerated at ordinary temperature for several days, and afterwards again heated in the waterbath; (3) white glue digested with glycerin for 3½ hours at a temperature of 160° F.; (4) common brown glue treated the same way; (5) white glue soaked in cold water for 12 hours and, after draining the water, heated with glycerin to 200° F.; (6) common brown glue treated the same way; (7) common brown glue soaked in cold water for 3 minutes, then with the superficially adhering moisture allowed to stand for 12 hours, and subsequently heated with glycerin like the former.

The materials used in these experiments were as follows: The glycerin was made by Wm. J. M. Gordon, of Cincinnati, free from inorganic impurities, without odor, and had a specific gravity of 1.24; the white glue was thin, hard, fractured readily,

and retained its hardness in damp weather; the brown glue was 4 to 5 times thicker than the former, and slightly flexible.

After No. 1 had been standing for 24 hours without examination the glue was found to be still firm; it could readily be broken into smaller pieces, but the sharp edges observable before were now softer and the surface of the glue, after removing the adhering glycerin by bibulous paper, was soft and readily scraped off. It became very evident that cold glycerin, undoubtedly owing to its tenacity, permeates glue very slowly. The glycerin, however, had dissolved a notable quantity of gelatine, which was readily proven by the flocculent precipitate produced by a solution of tannic acid.

When No. 2 had been digested in boiling water for 15 minutes, the glycerin likewise yielded a precipitate with tannin, but digestion for half an hour failed to unite the two substances completely. During the subsequent maceration for about a week the glue continued very slowly to swell, and by the final digestion for one hour it united with the glycerin, forming on cooling a firm jelly. No. 3 was occasionally stirred, and finally yielded an elastic, rather soft jelly. No. 4 under the same circumstances became almost gelatinous, the mass flowing about the same as thick Venice turpentine. No. 5 was completely dissolved after digestion for 15 minutes, the solution gelatinizing on cooling. Nos. 6 and 7 behaved exactly like the former, only requiring a little more time, namely, 5 and 12 minutes more.

For use in the arts, such as the manufacture of printers' rollers, the commoner qualities of glycerin are used, on account of their low price and because the small quantity of odorous principles and of inorganic constituents are without influence on the final result. These commoner qualities of glycerin are usually of less specific gravity than the Pharmacopœia requires. The glycerin used in the experiments just related was, therefore, better than the qualities likely to be employed, though, perhaps, of about the same specific gravity as the densest of the commoner qualities. Only two experiments were made with a glycerin fully up in every respect to the requirements of the U. S. Pharmacopœia. Experiment No. 8 was as follows: White glue of the same lot as before was digested for ten minutes at 200° F., with

Bower's inodorous glycerin, spec. gr. 1.25; the glue had been softened on the surface, the pieces had become adhesive, and the liquid contained notable quantities of gelatine in solution, readily proven by the flocculent precipitate occurring with solution of tannin, the results being exactly the same as in the first portion of experiment No. 2.

White glue was now soaked in water until it had become soft, the water was drained off and Bower's inodorous glycerin added (No. 9). Thus far no change has been produced in the appearance of the glue.

The results of these experiments may be summed up as follows:

1. Glue is soluble at the ordinary temperature in a large proportion of glycerin.
2. Glue is permeable by glycerin, slowly at ordinary, more readily at an elevated temperature.
3. Glue swelled in consequence of the absorption of water, remains unchanged in appearance under glycerin, that is to say, even if the glycerin should abstract the water, the former will take the place of the latter liquid, thus preventing the shrinking of the glue.
4. Glue, by continued digestion, dissolves completely in glycerin, gelatinizing on cooling.
5. The solution of glue in glycerin is accelerated by previous maceration in glycerin, and by increasing the temperature (doubtless also by increasing the pressure).
6. Glue thoroughly permeated by water dissolves in hot glycerin about as readily as it does in hot water.

It appears to me that the behavior of gelatin and glycerin to unite to a jelly of any desirable consistence might probably be made use of in medicine as a vehicle for medicines of an unpleasant taste. The antiseptic properties of glycerin would, doubtless, render such a jelly perfectly unchangeable, while its non-drying qualities would retain to the jelly its soft consistence. Of course there is no difficulty in imparting to such a preparation any desirable flavor.

In analysis gelatin is used to estimate the quantity of tannin contained in astringent vegetables, many of which are used for

tanning. There has always been a difficulty connected with such operations, due to the changes which gelatin undergoes so very readily when in aqueous solution, thus rendering the making of a new solution and its titration necessary. The complete solubility of gelatin, in even concentrated glycerin and the well known antiseptic quality of the latter, render it very probable that a solution of the former, in even dilute glycerin, may be kept unaltered for some time, in which case much time would be saved in such establishments where the assaying of tanning material has to be frequently performed. I hope to be able to extend my experiments in this direction and to report thereon at some future time.

CAMPHOR LINIMENT AN ANTIDOTE TO THE IRRITATION OF COWHAGE.

By J. WEICHELBAUM.

Editor Am. Journal Pharmacy :

SIR—In cleaning our store yesterday, one of our men came across, a can not labelled. Not knowing what it was, he took some out with his hand to examine it; the same time he called one of the boys, and asked him if he knew what it was; not knowing, he also took some in his hand. A short time afterwards, they both came to me, bringing the can with them, and told me all about how they got it on them. They said it itched terribly, and wanted me to apply something. The can contained *cowhage*. They tried to wash it off with soap and water before they came to me. I applied some olive oil, and several other oils, which relieved them not the least. A bottle of *Camphor Liniment* being near at hand, I tried some of that, which relieved the itching sensation at once. Seeing that it relieved the itching so quickly, I put some *cowhage* on my hand; after the itching commenced, I applied some of the Camphor Liniment, which relieved me in an instant.

Savannah, Ga., Oct. 22d, 1870.

DETECTION OF ADULTERATIONS IN COPAIVA BALSAM.

BY DR. H. HAGER.

The author has met with copaiva balsam adulterated with oil of sassafras. The adulteration is detected in the following manner: 1 c.c. balsam and 2 c.c. concentrated sulphuric acid are mixed; after the mixture has cooled, 20 c.c. alcohol are added, the mixture is heated to boiling, and then set aside. If the balsam be pure, after the addition of the alcohol, a milky grey yellowish or pale reddish yellow liquid is obtained, which on boiling, becomes yellow, clear and transparent, a resinous compound settling to the bottom. If adulterated with oil of sassafras, the addition of alcohol produces a dark brown-red color, becoming after boiling much darker, with a tint of violet, similar to the juice of black cherries.

Oil of turpentine, which is probably rarely used as an adulterant, is readily detected by heating slightly two to four drops of the balsam, dropped upon bibulous paper, in such a manner that no visible vapors are evolved. Oil of turpentine evaporates first and is recognized by its odor.

This test is unreliable if Venice turpentine is used for adulteration. The author invites experiments with the following test, which has given him reliable results: 5 or 6 drops of water and 5 to 7 c.c. balsam are mixed in an evaporating dish with sufficient levigated litharge to form a thick semi-liquid mass. At a temperature of 20 to 25° C. (68 to 77° F.,) a well marked turpentine odor is given off, if the balsam contains but 10 per cent. Venice turpentine, and even 5 per cent. may be still recognized.

An approximate quantitative estimation of the adulterant may be made as follows: 5 gm. balsam, 8 to 10 drops water, and 15 gm. litharge are heated for a quarter hour in a sand-bath, then for several hours in a water-bath. After cooling, the hard mass is rubbed to powder and boiled with benzin, the liquid evaporated and the residue macerated with 90 per cent. alcohol for several hours. The alcoholic filtrate evaporated to dryness, leaves about 0.2 to 0.3 resin, which, when boiled with solution of potassa, yields a filtrate which is not or scarcely tinged by sulphide

of ammonium. In the presence of turpentine, however, this last residue contains about three-fourths of the resin of the adulteration, and yields with potassa a liquid, in which sulphide of ammonium produces a bulky brown-black precipitate. The lead compound of the resin of turpentine is soluble in benzin and alcohol, but not the corresponding compound with the resin of copaiva.—*Ph. Cent. Halle*, 1870, 296, 297. M.

ON THE OXIDATION OF BRUCIA.

BY SCHENN, OF STETTIN.

Brucia is still sometimes employed as a test for nitric and nitrous acids. The red color passing into yellow, produced by a solution of brucia in concentrated sulphuric acid with nitric or nitrous acid, is not the result of the formation of a nitro compound, but the result of oxidation, and may likewise be obtained by chlorine water, peroxide of hydrogen, very dilute chlorate of potassa, very dilute chromic acid or chromate of potassa, dilute hypochlorite of soda, ferricyanide of potassium, bichloride of platinum, &c. If a drop of cupric chloride is added upon a few drops of solution of brucia, a rose-color is produced near the yellow margin resulting from the influence of the sulphuric acid.

The reaction is observed with auric and ferric chlorides only by not exceeding certain definite proportions. That the color is in reality a product of oxidation is more evident by the decoloration produced by protochloride of tin with some muriatic acid.—*Ph. Cent. Halle*, 1870, 283, 284, from *Fresenius Zeitschr. f. anal. Chem.* M.

DETECTION OF CARBOLIC ACID IN OIL OF CLOVES.

Hager (*Ph. Centr. Halle*, 1870, 281) agitates the suspected oil with six to ten times its volume of benzin; pure oil of cloves yields a clear solution; carbolic acid, if present, renders the mixture turbid and separates. Equal volumes, however, of carbolic acid, oil of cloves and benzin, yields a clear mixture.

Carbolic acid may likewise be removed from oil of cloves by

agitating it with dilute glycerin ; but the separation takes place slowly, rendering repeated agitation and boiling with glycerin necessary.

Flückiger (Schweiz. Wochenschr. f. Ph., 1870, No. 26) suggests to agitate from 2 to 10 grammes of the oil with 50 to 100 times its quantity of hot water ; after cooling, the latter is poured off and concentrated by slow evaporation at a low temperature. To a few cubic centimetres of the aqueous solution, a drop of ammonia is added, and a small quantity of good chlorinated lime sprinkled upon it ; if phenol has been present, the liquid, after some agitation, will assume a green color, passing into blue, which is permanent for some days. Pure oil of cloves does not show this behaviour.

Phenol dissolved in 100 parts of water strikes a beautiful violet color with ferric chloride ; in the presence of oil of cloves, the reaction either does not take place, or not sufficiently distinct.

M.

NEWFOUNDLAND COD-LIVER OIL.

The process of manufacturing the far-famed cod-liver oil at Portugal Cove, Newfoundland, is described in the *St. John's Telegraph*. The livers of the cod are sold by the fishermen to the manufacturer of the oil at the rate of 24c. a gallon. On the average it requires $2\frac{1}{2}$ gallons of liver to produce a gallon of oil. The livers are first carefully washed, and must be "cooked" at once, while fresh. They are first put into a large tin boiler. This is plunged into a larger iron boiler filled with hot water, the water not being allowed to touch the livers, which are thus gently steamed till a quantity of oil is floating on the surface. This is dipped out and filtered through blanketing first ; then twice afterwards it is filtered through bags of moleskin. From the last filtration it comes out of a beautiful crystalline transparency, and without any unpleasant smell or taste. The oil is now poured into 60 gallon casks, and forwarded to the exporting merchant. The refuse is placed under screw presses and the remainder of the oil extracted. This is not refined, but sold as common cod oil, and is used largely on railways and for lubricat-

ing machinery. The cod-liver oil has gone up in price lately, owing to the immense demand for it in Europe, and now it is sold to the merchant at the rate of 130 cents a gallon. Last year 330 tuns of it were exported, the value being 260 dols. per tun. Of the common cod oil, unrefined, 4,521 tuns were exported, the value being 144 dols. per tun. So plentiful has been the catch of cod this year that in one factory 2,000 had been barrelled before the season was half through. The men who handle it get quite a liking for the oil. A little dog running about the premises laps it eagerly. The secret of making good cod-liver oil lies in the application of the proper degree of heat—too much or too little will seriously injure the quality. Great attention to cleanliness is also necessary, the filtering bags requiring to be washed thoroughly every day, and the troughs scrubbed out with great care. The rancid oil that is frequently met with is the produce of manufacturers who are careless about these matters. The best oil is made in the way above described; and all the pretences of quacks about refining it, and making it palatable, are, it is declared, mere moonshine, and either covers for adulteration, or such as deprive the oil of its medicinal properties. There is, no doubt, an enormous amount of adulteration practised by the retailers of cod-liver oil, but it is maintained that it is not done in Newfoundland. The greater part of the oil goes to London, and there it is “doctored.” The writer in the St. John’s paper states that were a person with competent skill and capital to embark in the manufacture in Newfoundland on an extensive scale, and bottle the oil on the spot for the retailers, guarding it by a label and other securities, and guaranteeing a pure article of the best quality, his oil would speedily take the the lead in the market.—*The Canadian Pharm. Journ.*, Toronto, Ont., Oct., 1870, from *Chem. and Drug*.

GENERATION OF HEAT BY FUNGI.

Dutrochet has observed that there is more heat generated by *Boletus æneus* than by any other vegetable, with the exception of *Arum*. This phenomenon is, however, by no means confined to *B. æneus*, but is, I believe, common to all *Boleti*; and when de-

composition has set in, the heat evolved is considerable, but even when perfectly young and fresh all the Boleti give out heat. Whilst packing up the three large and beautiful specimens of *B. colopus*, Fr., exhibited by me at the last meeting of the Royal Horticultural Society, I noticed the decided heat evolved from the specimens. At the time of packing, my plants were perfectly fresh and young, and after being placed in a light paper box for a short time, the heat evolved was apparent to the hand. I tested the heat with a thermometer, which stood outside the box in a shaded room at 70° , this after being placed in the box with the Boleti for half an hour rose to 75° . This fine species, though I believe rather rare elsewhere, is common in early autumn in Epping Forest, where it grows in company with another beautiful species, *B. pachypus*, Fr. Both attain here very large dimensions, and the former is extremely beautiful; the tubes are at first brilliant yellow, then orange; the stem deep carmine with a rich maroon base; flesh immediately changing to bright blue when cut or broken.—*Lond. Pharm. Journ.*, Sept. 3, 1870, from *W. G. Smith in Gardners' Chronicle*.

SIMPLE METHOD FOR PURIFYING METALLIC ARSENIC.

In order to restore to this metal its bright aspect, and also for the removal of any slight coat of suboxide which may adhere to it, the author advises that the metallic arsenic should be boiled for a few minutes in a moderately strong solution of bichromate of potassa, slightly acidified with sulphuric acid. The metal is next first washed with water, and then with alcohol or ether, and lastly placed in a small tube closed at one end, and sealed immediately after the arsenic has been put into it. Phosphorus, which has been kept a long time under water, and has become thereby coated with a whitish yellow crust, may be treated in the same way, when it becomes quite colorless again. The phosphorus should be, of course, carefully treated, so as to prevent its ignition; and, after having been well washed with cold water, should be preserved in water freed from air by having been previously boiled for a long time and cooled in a well-closed vessel. *Lond. Chem. News*, Sept. 30, 1870.

NEW PROCESS FOR THE QUANTITATIVE ESTIMATION OF THE ALKALOIDS OF THE CINCHONA AND CALISAYA BARK.

BY P. CARLES.

The author begins with giving a review of the different methods hitherto in use for the quantitative estimation of the alkaloids alluded to, which methods may be divided into two main classes—viz., those by which the whole of the alkaloids are estimated together, and those by which only the quinine is estimated. The author's new method is the following: A fair average sample of the bark to be tested is ground up to a fine powder, and sifted, but any residue left on the sieve is to be pulverized again. 20 grms. of this powder are taken and intimately mixed, in a mortar, with 8 grms. of quick-lime, slaked, just previous to use, with 35 grms. of water. The pasty mass thus obtained is dried on a water-bath. As soon as the mixture has become dry enough to be broken up into small lumps, this is done, and the lumps placed in a funnel-shaped tube, the lower and narrower opening of which is closed by a plug of cotton wool. Chloroform is poured over the mass, a quantity of 150 grms. being sufficient, and the last traces of that fluid are washed off with some distilled water; the larger portion of the chloroform is either evaporated or (as may suit the operator) distilled off on a water-bath, and the residue taken up with from 10 to 12 c.c. of dilute sulphuric acid (1 of acid to 10 of water). This solution is poured on to a previously well-moistened filter, which retains the resinous matters, while a clear liquid runs off. The filtrate is boiled, and when in full ebullition, ammonia is added to it, so as to leave only a slightly acid reaction; all the sulphate of quinine crystallises out, while the mother-liquor retains the rest of the alkaloids, which may be separated by precipitation and further tested. The author has added to his paper some tabulated results of experiments made by him with the same quantity of bark, and operating with various methods executed carefully, as described by the original authors and suggestors of these methods, in order thus to prove the superiority of his method.—*Lond. Chem. News*, Sept. 2, 1870.

ESTIMATION OF GLUCOSE IN COMMERCIAL SUGARS.

BY J. MIDY.

The author prepares a Fehling test-liquor of such a strength that 100 c.c. thereof are completely decomposed by 1.05 grms. of uncrystallizable sugar (1 c.c. of the liquor agrees, therefore, with 0.0105 of glucose); a solution is also made of 20 grms. of the sugar to be tested in 150 c.c. of distilled water. To this solution, previously heated till near its boiling-point, is added, by means of a Mohr's burette (divided into 1.10th c.c.), $\frac{1}{2}$ c.c. of the Fehling cupreous liquor; the sugar solution is withdrawn from the source of heat, and, after having been stirred up, the suboxide of copper, if any has been formed, is allowed to settle. When this has taken place, a very small portion of the liquid is filtered through Swedish filtering paper, and to the filtrate is added a drop of a concentrated solution of ferrocyanide of potassium and acetic acid. If too much of the cupreous test-liquor has been added, the addition of the reagents alluded to will have the effect of causing the formation of the well-known precipitate of ferrocyanide of copper; and, in that case, a fresh sugar solution has to be made, and only $\frac{1}{4}$ c.c. of the cupreous test-liquor has to be added; and the ferrocyanide should not give indications of excess of copper in the filtered liquid as above alluded to. Such being the case, the operator knows that 20 grms. of sugar contain less than 0.0052, and more than 0.0026, of glucose; taking the average of these figures, which is 0.0039, and multiplying by 5, we learn that the sample of sugar tested contains about 0.0195 per cent. of glucose.—*Lond. Chem. News* Sept. 2, 1870, from *Revue Hebdomadaire de Chimie*, July 28, 1870.

HYDRATE OF BROMAL.

There is a valuable article by Dr. E. Steinauer, of Berlin, in the last volume of "Virchow's Archiv," on the action of the hydrate of bromal on animals and on man. The experiments were made in the Berlin Pathological Institute, and were under the immediate observation of Liebreich himself. The hydrate of

bromal, according to the observations detailed, when administered to animals, undergoes a similar change to that undergone by chloral, being converted by the alkalies of the blood into bromoform. But this change goes on slowly, for at the end of an hour and-a-half there was found in the blood, in addition to bromoform, still some undecomposed bromal. The substance is further oxidized and evacuated in the urine as bromide. The symptoms produced by bromal on animals (frogs, rabbits, guinea-pigs,) were first a stage of restlessness, followed by imperfect sleep and anæsthesia, and finally dyspnœa and death with or without convulsions. After large doses, both in frogs and rabbits, the heart was found after death relaxed and distended,—whereas, after smaller doses, it was contracted. In the former case there is probably direct paralysis of the heart by the bromoform, such as occurs after large doses of chloroform. The preliminary stage of restlessness, which has no equivalent after administration of chloral, is ascribed to the action of the bromal aldehyde itself, the decomposition occurring, as stated above, more slowly than is the case with chloral. The author observed a stage of restlessness, after a hypnotic dose of chloral, in a patient suffering under gout, and he ascribed this to the acid state of the blood preventing the usual decomposition into chloroform. With this view he administered alkalies to the patient, and after a few days the same dose of chloral produced the usual hypnotic effect. Proceeding from this, he applied the same principle in his experiments with bromal. Having injected carbonate of soda subcutaneously in rabbits, he then injected the hydrate of bromal, and found that the stage of restlessness was entirely absent. The author has administered bromal to man in only a few cases. He has found good effects from it in epilepsy, and in soothing the pains of tabes dorsalis. The method of administration which he has ultimately employed is, first, in the morning and at mid-day a powder containing about 14 grains sodæ bicarb.; then in the evening two to four pills, containing each from $\frac{1}{2}$ to $1\frac{1}{2}$ grain of bromal.—*Medical Press and Circular*, Dublin, Aug. 24.

ON THE CONGELATION OF BISULPHIDE OF CARBON.

BY N. V. WARTHA.

The congelation of bisulphide of carbon, which, according to the treatises on chemistry, requires a temperature of -90° for its solidification, may be easily effected by directing a very rapid current of dry air upon the surface of the pure liquid (purified by an amalgam of silver) contained in a glass vessel.

If a thermometer be plunged into the bisulphide of carbon during this operation, a snowy crust will be noticed covering the sides of the vessel and the thermometer, even before the temperature has become 0° . The temperature then rapidly descends to -18° and a white mammillated mass rises to the surface, and sometimes even stops up the tube for conducting the air. Soon all the liquid disappears and the thermometer commences to rise again up to -12° , where it remains stationary as long as the bisulphide of carbon is solid. In this state it presents the same phenomena as solid carbonic acid.

The bisulphide of carbon will remain solid for some time, and in this state it possesses a peculiar aromatic odor. Its formation may be utilized for the production of ice, thus: add to some water contained in a capsule, a few cubic centimetres of bisulphide of carbon, and bring a rapid current of air to play upon it. The water will soon solidify, just as the bisulphide of carbon itself, provided the latter is present in sufficient quantity, the temperature may then reach -15° .

Bisulphide of carbon cannot be solidified in vacuo, except it be mixed with ether.

The temperature above cited are in degrees centigrade.—*Deutsche Chemische Gesellschaft*, 1870, No. 2, in *The American Chemist*, Oct., 1870.

INEFFICACY OF YOUNG CANTHARIDES.

According to J. Neutwich, the young immature cantharis insect does not possess the blistering property; it is only the adult flies, capable of the act of reproduction, which contain cantharidin.—*Zeit. fur Chem. and Rép. de Pharm.*

OPHELIA CHIRAYTA.

BY FLÜCKIGER AND HOHN.

This plant is little known in Europe, and is not much used even in England, although it has a place in the British Pharmacopœia of 1867, as well as in that of the United States of 1866. But in India Chirayta has long been in high repute, and is generally sold in the bazaars. It is also mentioned among the large numbers of medicinal agents comprised in the "Systema Medicinæ" of Susrutas, about ten centuries before our era. The Sanskrit name is *Kiratatikta*, or the bitter herb of the Kiratas, a half-caste race that had been driven back into the hill country of northern India. It is with good reason, therefore, that this plant has always received attention from English physicians in India, and that it has been included in the Indian Pharmacopœia of 1868.

Strangely enough, Guibourt attempted to refer to *Chirayta* several of the older descriptions and drawings of the *Calamus aromaticus*, *odoratus*, or *verus* that was brought at an early period from India to Europe. It is true he pointed out the total absence of aroma, so that the remarks of Fée and Royle sufficed to prove the total difference between the odorless *Chirayta* and *Calamus*, although the history of the latter is not yet fully ascertained.

This plant, from which this bitter herb is derived—*Ophelia** *chirata*, Griseb.—was first drawn by Roxburgh in 1814, under the name *Gentiana Chirayta*; subsequently also by Wallich, by Don (as *Agathotes Chirayta*), by Wight and Cleghorn. It is an elegant annual *Gentiana* of the lower Himalaya, occurring from Simla, and through Kumasu, as far as Nepaul. In its outward appearance *Ophelia Chirayta* closely resembles our *Erythrœa Centaurium*, though with several differences.

The Chirayta commonly met with in English commerce is usually of very inferior character, and chiefly consists of stalks deprived of their leaves. The plant that has been examined by Höhn, consisted, on the contrary, of well-preserved speci-

* Derived from ὄφελος, useful, in reference to the medicinal virtue of the plant.

mens retaining flowers, fruit, and roots, so that the essential characteristics of that nature could be well observed. For the supply of this material I am indebted to the kindness of my friend Daniel Hanbury.

The woody stems were from 2 to 3 feet long, and $\frac{1}{4}$ inch thick at the lower ends, cylindrical, with knots at distances of $1\frac{1}{2}$ to 3 or 4 inches, at the upper ends obtusely quadrangular, with wings extending downwards. The colors varied from brownish-yellow to dark purple-red. The branches were more greenish or greyish-brown. The root is sometimes from 2 to 4 feet long, and twice as thick as the stem. It forms generally a simple tap-root, furnished with somewhat scanty fibres. Larger specimens present an angular bending of the root, probably indicating a growth of more than one year. Generally the stem rises isolated from the root, but in some instances I met with plants consisting of several stems. The numerous prolonged branches resemble in their arrangement those of *Erythræa Centaurium*, and towards the upper part they form a thick whorl. The insertion of the leaves and flowers may also be compared to that of the indigenous Gentian referred to above. The lower leaves of *Ophelia* are often 3 cm. in length and 7 mm. broad; the upper ones are very much smaller. All of them are acutely lancet-shaped, smooth-edged, cordate at the base, and, like the entire plant, perfectly glabrous. According to the size of the leaves, they present 3, 5, or 7 ribs, of which the central one is the thickest.

The yellow, 4-parted corolla is about 12 mm. long, and rather glandular at the base. The calyx is much shorter than the corona. The fruit is a 1-celled capsule, with two valves at the apex.

The flower possesses the same intense bitter taste that is characteristic of Chirayta. It is only the woody substance of the thickest stems that is not bitter; this contains a considerable pith. Even the branches present in sections a broad ring.

The popular name of this drug in India is *Oreyat*, and it has been applied to several varieties of *Ophelia*; but it seems that *Andrographis paniculata*, Wallich (*Justicia paniculata*, Burm.), an *Acanthacea*, frequent in Bengal, is principally understood

under that name (or, properly, *Kiratha*). This plant, which is only 1 or 2 feet high, also tastes intensely bitter, but it is distinguishable by its alternate, long-stemmed flowers, with rose-colored bilabiate corolla. Moreover, the flower forms a panicle.

While *Ophelia Chirayta* is distinguished as *dukhani*, or southern Chiretta or Creyat, the *Ophelia angustifolia*, Don, is, on the contrary, termed *pahari* Chiretta, as coming from the mountains. This variety grows in the same districts as the true Chirayta; but it has leaves that are almost lineal, and the flowers have a white corona, with violet spots, that is shorter than the calyx.

On the contrary, *Ophelia elegans*, Wight, is indigenous to the mountains of southern India, and in the bazaars of that district it is described as inland Creyat. It has blue flowers.

Lastly, the Indian Pharmacopœia mentions the white-flowered *O. densifolia*, Griseb. (*O. multiflora*, Dalzell). All these varieties are described as quite as bitter as the true Chirayta, and as being, in fact, used in the place of it throughout the north-western, central, and southern provinces of India.

These varieties of *Ophelia* correspond in their native country to the allied indigenous European plants which have been introduced into medical use here, and from that point of view their investigation by Höhn presents some pharmaceutical interest. In the Indian Pharmacopœia there is an infusion of Chirayta, and an aromatic tincture with cardamoms and orange-peel.

By extracting the stalks and roots with alcohol of 60 per cent. sugar, wax, chlorophyll, soft resin, tannin, an acid (ophelic), and a peculiar bitter substance (chiratin) were dissolved.

The acid was syrupy, and very[†] deliquescent, yellowish-brown, tasting at first slightly sour, afterwards intensely bitter. When warmed it smells like lugian; it dissolves in water with some turbidity (due, perhaps, to resin), completely in alcohol, or a mixture of spirit with ether. It decomposes alkaline solution of copper when warmed with it; also ammoniacal solution of silver with alkalis it darkens; with perchloride of iron it becomes reddish-yellow; with sulphate of copper dirty green; with lead salts yellow, and forms amorphous compounds with acids. Analysis of the lead compound gave $C_{26}H_{20}O_{20}$ as the formula.

Chiratin is a pale yellow, very hygroscopic powder, at the utmost capable only of a granular crystallization; it is very bitter, sparingly soluble in cold water, rather more in hot water, readily soluble in alcohol or ether. It is neutral to test-paper, does not reduce alkaline solution of copper, and gives with tannic acid a copious white flocculent precipitate; formula $C_{52}H_{48}O_{30}$. By the action of acids chiratin is separated into ophelic acid and a yellowish-brown amorphous substance that is not sugar, but tastes bitter, is scarcely soluble in water, readily soluble in spirit, does not reduce copper solution. Höhn assigns to it the formula $C_{26}H_{24}O_6$, and the name Chiratogenin.

The herb itself gave the same results as the stem and roots.—*Pharm. Journ., Lond., Aug. 6, 1870.*

THE ADULTERATION OF SAFFRON.

BY DANIEL HANBURY.

Saffron is, at the present time, the subject of a serious adulteration, to which I think it important to call attention, the more so as I find that its nature and extent are not fully known even to experienced druggists. Saffron adulterated in the manner I am about to describe, is, for the most part, *undistinguishable to the eye* from the drug in a state of purity, yet the means of discriminating between the genuine and the fraudulent are of the most simple character.

Let me remark at the outset that there is, in my opinion, no method of testing saffron more effectual than that of scattering a very small pinch on the surface of a glass of warm water. The stigma of the saffron-crocus immediately expands, and exhibits a form so characteristic, that it cannot be confounded with the florets of safflower, marigold or arnica, or with the stamens of crocus itself.

It was in performing this simple operation that I detected that some saffron which I had just purchased had been treated with a heavy earthy powder, which speedily separated from the lighter stigmata, and fell to the bottom of the glass. Upon collecting and examining this powder I found it to be *carbonate of lime*, which, by some ingenious process of which I am ignorant, had been

made to adhere to the thread-like saffron without in the least altering its general appearance.

To ascertain the amount of earthy matter thus fraudulently added, I subjected several specimens of saffron to incineration, each having in the first instance been dried in warm air until it ceased to lose weight. The results obtained in the examination of eight samples are indicated in the following table :

Examination of Saffron.

Sample.	Description.	Percentage of Ash.
No. 1	Origin unknown, . <i>pure.</i>	5.90
" 2	" " " "	4.48
" 3	Valencia, . . . "	4.41
" 4	" . . . "	5.20
" 5	Alicante, . <i>adulterated.</i>	21.22
" 6	" . "	12.72
" 7	" . "	28.01
" 8	" . "	15.36

Sample No. 2, the quality remarkably fine. Sample No. 3, so-called *Valencia*, pure, but not of finest quality. Sample No. 7, adulteration perceptible to the eye, many of the stamens being crusted with an orange-colored earthy powder.

The method of testing a sample of saffron for earthy adulteration which I recommend is this :—Place in a watch-glass a very small quantity (say, 1 grain) of the saffron, and drop upon it 8 or 10 drops of water ; lightly touch the saffron with the tip of the finger, so as to cause the water to wet it. If the drug is free from earthy matter, a *clear*, bright-yellow solution will be immediately obtained ; if adulterated, a white powder will *instantly separate*, causing the water to appear *turbid* ; and if a drop of hydrochloric acid be now added, a *brisk effervescence* will take place.

Saffron almost always contains a few of the pale yellow stamens accidentally gathered ; but the pollen from them which is detached when the drug is wetted, but which is minute in quantity, is easily distinguished from carbonate of lime by not dis-

solving when hydrochloric acid is added. Moreover, the form of pollen-grains may be easily recognized under the microscope.

* * Since the foregoing paper has been in type, I have received the *American Journal of Pharmacy* for September, in which I find a note by Professor Maisch calling attention to the adulteration which I have here described.*—D. H.—*Lond. Pharm. Journ.*, Sept. 24, 1870.

SACCHARO-CHIRETTINE, A NEW PREPARATION OF CHIRETTA.

BY MR. D. S. KEMP, Bombay.

The two official preparations of Chiretta, the *tincture* and the *infusion*, although efficient as containing the active matter of the drug, present inconveniences for habitual administration. The *tincture* becomes impaired in strength by keeping, and is partially incompatible with salts of iron and of the alkaloids; and the infusion, besides having the same incompatibilities, will not keep longer than a few hours.

The *extract*, prepared in the usual way, is a still more unsatisfactory preparation, containing, as it does, a mere fractional part of the bitter originally in the dried plant. I have not seen an extract of chiretta prepared entirely *in vacuo*; probably such would be a valuable product, although still liable to deterioration. No preparation can, in my opinion, be good which undergoes evaporation by heat or exposure to the air, as I have always found that the bitter principle in such a process disappears, and is replaced by a tasteless brown resinous matter, separating from the aqueous solution. The following is the process by which I have succeeded in obtaining a trustworthy preparation of chiretta:

An infusion of chiretta was made at 120°, and the coloring matter precipitated by an excess of solution of subacetate of lead; the product, after filtration, was a nearly colorless but very bitter liquid. The addition of a sufficiency of ammonio-acetate of lead (mixture of ammonia and solution of acetate of lead) then produced a white precipitate, consisting of the whole of the chirettine in combination with lead. The precipitate being well

* First noticed by M. Blachez, in *Jour. de Pharm.*, Avril, 1869. See this Journal, July, 1869—ED. AM. J. PH.

washed, first with ammonical water, then with alcohol, was treated with a mixture of sulphuric acid and alcohol and filtered. The filtrate containing the chirettine was further treated with carbonate of lime to remove the excess of acid. The filtered liquid, which was of indescribable bitterness, I had no means of subjecting to more appropriate evaporation than spreading out on a clean glass plate; the result being a transparent extract, pale yellow in color, dry at first, but in time becoming moist. This product I consider to be impure chirettine; and the same has always resulted when modifications of the above process were tried.

It is a neutral substance, quite soluble in water and alcohol. Its aqueous solution, when evaporated in the air, deposits a tasteless brown resin, into which the chirettine becomes entirely converted if the evaporation is continued to dryness. It is very difficult to preserve the pure solution at all from this change; if aqueous, it deposits the resin; if alcoholic, it darkens in color. But the addition of glycerin will preserve either solutions apparently unchanged for many months. Dilute acids do not affect chirettine; but liquor potassæ hastens its conversion into resin.

I now prepare two pharmaceutical forms of chiretta founded on this process, one, saccharo-chirettine, a dry product; the other, liquor chirettine, a liquid.

Saccharo-chirettine.—To prepare this, I follow the process above described with an economical modification, namely, instead of drying the chirettine, I add to its pure solution a proportion of sugar (20 lb. for each 60 lb. of chiretta used), dry the whole by gentle evaporation, and powder it. The quantity of bitter principle present causes quite a minute increase in the weight of the product, which is, notwithstanding, so bitter that 1 grain is perceptible in a gallon of water.

When well prepared, in a dry atmosphere, saccharo-chirettine is nearly white. It forms a clean solution with water, and in portability and handiness for administration I submit that it is a most convenient pharmaceutic form of the drug it represents. The strength of saccharo-chirettine is as one to three of the herb; 10 grains being equal to 30 grains of chiretta, or about

2½ fluid ounces of infusion. It is given as an antiperiodic in doses of 10 to 15 grains, three times daily, and here, in Bombay, considered equal to 3 to 5 grains of quinine.

A decided advantage that can be given it over chiretta is that some uniformity of strength can be guaranteed by regulating the quantity of sugar used according to the proportion of ammonio-acetate of lead required to precipitate the chirettine.

That chiretta varies considerably in strength I have found by experience.

The CHAIRMAN stated that he had not found the tincture of chiretta give any deposit on keeping in this country. Probably the difference in this respect might be due to climate.

Professor ATTFIELD remarked on the peculiarity of the active principle of chiretta in undergoing decomposition when its solution was evaporated, as being a character worth examination from a chemical point of view, as well as in its bearings on the making of pharmaceutical preparations of chiretta.

Mr. GROVES approved highly of the principle on which the manufacture of saccharo-chirettine was based. He also thought that the satisfactory results obtained by the author in this instance seemed to show the wisdom of using sugar in certain pharmaceutical preparations as a preservative, and he referred to the old practice of preparing medicines in the form of troches, etc., as one probably useful on that account, which might with benefit be reverted to in our day, especially in the case of medicines destined for export to foreign countries.—*Proc. Brit. Pharm. Conf., in Lond. Pharm. Journ., Sept. 24, 1870.*

THE PURITY OF THE YELLOW BEESWAX OF PHARMACY.

BY EDWARD DAVIES, F.C.S.

In this paper I am only able to give the result of the examination of some samples of wax purchased in Liverpool, five samples of crude wax obtained from a wholesale house, and four samples sent to me for analyses from a Liverpool firm, of the history of which I am ignorant.

I shall first give the methods employed, then a table of the re

sults, and conclude with a few remarks. The melting-point presents a little difficulty, and, after trying various methods, it was found better to take the solidifying-point. A test tube containing about 100 grains of wax was immersed in hot water in a beaker until perfectly melted. A thermometer was inserted in the tube and the water allowed to cool gradually, the wax being constantly stirred until the bulb of the thermometer could not be seen when in the middle of the wax. The temperature then remains steady during the solidification for about two minutes, and there is no difficulty in getting the same result any number of times within half a degree.

The presence of paraffin is shown by the low melting-point, but no idea of its amount can be obtained from the degree shown, owing to the varying melting-points of different samples of paraffin. The only method of determining the amount of paraffin found at all practical, consists in destroying the wax with fuming sulphuric acid. 50 grains of the wax with $1\frac{1}{2}$ oz. by measure of fuming sulphuric acid, are put into a small beaker holding about 5 oz., and gradually heated in a water-bath. Great care must be taken to stir it very slightly at first, especially if only a small quantity of paraffin is present, as the action is apt to become unmanageable. When the violence of the action is over, the heat is raised to 100° C. for about an hour and a half and the mixture occasionally stirred. It is then left to cool very slowly in the water-bath, and, when quite cold, the paraffin will be found forming a layer on the black semi-liquid mass. It is carefully removed, washed with water to remove as much of the adhering acid as possible, dried, and again heated for an hour in a smaller beaker with $\frac{1}{2}$ oz. of the acid. This gives the paraffin perfectly white, and it is then washed, dried and weighed. There can be no doubt that there is some loss, as the common paraffin employed contains coloring matters destroyed by the acid; but I know of no other method at all useful, though I have carefully tried some which have been proposed.

For the estimation of rosin, the action of cold alcohol seems sufficient. To 90 grains of pure wax, 10 grains of rosin were added, by melting them together and thoroughly incorporating. On exhausting with cold alcohol, by rubbing the wax in a mortar

with successive small portions of alcohol, filtering, and evaporating on a water-bath, a residue was obtained weighing 10.54 grains. It was brittle and, when heated, gave an unmistakable smell of rosin. Pure wax yields 2.4 per cent. to cold alcohol, and rosin is not entirely soluble, but one of these about balances the other.

No starch was found in any of the samples, and they were all perfectly soluble in turpentine.

Specimens.	Solidifying point.	Soluble in Alcohol.	Paraffin.
Pure Scotch wax.....	151.5	2.4p.c.	none
Crude wax, Gambia.....	152.5	3.10	not tested
“ “ No. 1.....	154.0	2.40	“
“ “ No. 2.....	153.0	3.60	“
“ “ No. 3.....	147.5	.....	“
“ “ No. 4.....	147.0	.....	“
“ “ No. 5.....	146.0	.....	none
Purchased samples, No. 1.....	153.5	1.8p.c.	not tested
“ “ No. 2.....	153.0	2.28	“
“ “ No. 3.....	152.0	3.18	“
“ “ No. 4.....	152.0	2.34	“
“ “ No. 5.....	150.5	5.20	“
“ “ No. 6.....	147.0	.....	“
“ “ No. 7.....	145.0	.....	none
“ “ No. 8.....	139.0	.....	13.30
“ “ No. 9.....	137.5	.....	36.60
Samples sent for analysis, No. 1.....	142.0	.....	42.60
“ “ No. 2.....	140.0	.....	43.36
“ “ No. 3.....	135.0	.....	56.50
“ “ No. 4.....	134.0	.....	56.00

These results show that the degree given in the P. B. of 140° F. is too low; pure yellow wax melts at 151.5° F., and no sample, not containing paraffin, has a melting-point below 145°. I think that 150° should be the standard, for samples containing more than 40 per cent. of paraffine may be made to agree with the Pharmacopœia standard, if a paraffin with a sufficiently high fusing point be selected. The question may seem an unimportant one, but a difference of 16° in the fusing-point of two samples of wax must considerably affect the quality of ointment made from them, especially in hot weather.

The effect of the application of paraffin to the skin, though probably not injurious, is not sufficiently known to render its

presence a matter of indifference. Most of the samples were bought in the lower parts of the town, and the results show that in Liverpool there is not much cause to complain. I have to thank Mr. Thomas Williams for valuable assistance in working out the above results.

The CHAIRMAN said that the fatty material referred to by Mr. Davies might probably be stearin, which was used in the neighborhood of Bristol for adulterating wax sometimes to the extent of fifteen or twenty per cent. He had found as the result of experience that if there was a crack about an inch from the upper edge of the cake, together with a greasy appearance, these characters indicate the presence of stearine.

Professor ATTFIELD remarked that this was an interesting practical paper, and that the results were in favor of his suggestion that the melting-point assigned to beeswax in the Pharmacopœia should be raised ten degrees above the number now given. Some discussion took place as to the mode of determining the melting- or rather solidifying-point of wax and similar materials.

Mr. GROVES (Weymouth) pointed out that a difference of ten degrees in the result of experiment might be due to the method adopted. He recommended dipping a thermometer bulb in the melted wax, and after the film of wax had solidified upon the bulb, suspending the thermometer in water, which was gradually heated until the film of wax became transparent and liquid; then reading off the temperature at which this took place as the melting-point.

It was also mentioned that the presence of Japan wax would render the melting-point of beeswax low, but no known means seemed to be available for detecting this admixture, except the occurrence of that kind of bloom on the surface of the wax so adulterated, which is characteristic of Japan wax itself, as stated by Mr. Parkinson, Ph.D., Bradford.

Mr. DAVIES said that he had found that pure wax, when melting, passes suddenly from the opaque to the transparent condition, but that when paraffin was present the transition was gradual.

Mr. BRADY (Newcastle) recommended that as this was a sub-

ject of much pharmaceutical interest, well-authenticated samples of wax should be sent to Mr. Davies for examination, and that he should be requested to continue his inquiries so as to report on the subject at a future meeting of the Conference.—*Proc. Brit. Pharm. Conf., in Lond. Pharm. Journ., Sept. 24, 1870.*

PHARMACEUTICAL NOTES.

BY ALBERT E. EBERT.

Not the least duty of the pharmacist, though one more honored in the breach than the observance, is his obligation to communicate to his fellows of the craft such improvements in manipulation, in apparatus, and in the convenient arrangement of his shop, as his every-day experience behind the counter must occasionally suggest. How much practical, *desirable* information is hid under a bushel by this sin of omission, we can only conjecture; but if the thousands would communicate their personal experience, it cannot be doubted that a valuable fund of useful knowledge would accumulate. The following suggestions are made with no great claim for their originality or importance; but, since they are based upon actual experience, they may be of utility to others as they have been to us.

Test tubes, indispensable for their legitimate purpose, will often answer another useful end. For effecting solutions of small quantities of the alkaline or metallic salts, especially when the solvent is of a viscid nature, we have found the test tube a valuable auxiliary—more convenient in use than the mortar, less wasteful, and effecting the solution with greater despatch. We proceed by dropping the salt into the tube, adding a portion of the vehicle, and applying heat, with constant shaking of the tube. Solution quickly follows, the warm liquid is added to the remainder of the vehicle, previously placed in the vial, and the whole is mixed by agitation.

Of course, the dispenser will see that this method of procedure is not applicable where the quantity of the salt exceeds its solubility in the whole liquid at ordinary temperatures, as crystallization would occur. This relation of salt to solvent is often met with, and then the only resort is to the mortar, in which the salt

may be rubbed to powder before its mixture with the liquid, and the attachment of a "shaking label" to the vial. Solid extracts may be brought into solution by the same means with great facility.

The moral effect of such a display of chemical ware before the admiring eyes of the patient may be considered, in some rare instances, as equally beneficial with the product of the combined skill of the physician and pharmacist.

In spreading plasters extemporaneously, convenience requires and neatness demands an uncoated marginal edge. This is usually secured by pasting strips of paper along the edges of the skin, and removing them after the spreading of the plaster is effected. It is just here that a practical difficulty frequently arises. The paper edges are liable, from drying of the paste, to adhere so strongly that either paper or skin will give way upon an attempt at their removal; the application of water will then be necessary to soften the attachment, and the final result may be expected to present a daubed and uncleanly aspect. This difficulty may be entirely avoided by applying to the paste brush a little glycerine before the adjustment of the marginal strips.

COATING OF PILLS.—A prevailing fashion in pharmacy, or rather among prescribers, is the use of sugar-coated pills. This is very detrimental to the practice of legitimate pharmacy, whatever may be its effect upon those who swallow the pills. An extemporaneous process of sugar-coating is a desideratum for which our colleges of pharmacy should unite in offering a prize. In the absence of this, a very excellent substitute may be found in resin. This substance is easily applied, gives a hard, tasteless surface, a handsome appearance, and has a decided tendency to protect the pills from change. The coating cannot interfere with their medicinal action, for it is readily dissolved by the fluids of the stomach. The process of coating is easy and expeditious, and no apparatus is required.

We proceed as follows, keeping prepared a solution of resin in ether, one part of resin to ten parts of the fluid: We return the pills, after they have been rolled to shape, to the mortar in which their ingredients were mixed, pour over them a little of the resinous solution, give the mortar a few twirls, and roll them

out upon the platform of the pill machine or pill tile. By the time the label is prepared the pills will have become sufficiently dry to allow boxing. A little dusting powder, preferably lycopodium, should be dusted over them, and the work is done.

Speaking of pills, an idea occurs which is worth suggesting to the manufacturers of pill machines—namely, that these convenient implements be made to cut thirty pills instead of twenty-four. The former number of pills is much more frequently prescribed than the latter. A great improvement would be the placing of numerals before each groove, so that the operator may not be obliged to count the grooves whenever a fractional number of pills are to be divided.

While making suggestions, we will continue by adding that there is a great need for vials, especially for half, one and two ounce vials, with lips suitable for dropping liquids. With the ware of the market at present, it is almost impossible for an expert to be successful in dropping, so what must be the experience of invalids and nurses in this respect? The defect may be easily remedied by making the lips of vials for such uses broad and *thin*. If we insist in demanding such improvements as we are suggesting, manufacturers will be eager to supply them.—*Pharmacist*, July, 1870.

CULTIVATION OF CINCHONA IN MEXICO.

Mr. Hugo Finck, Vice-Consul of the North German Confederation at Cordova, Mexico, writes as follows, under date 10 July, 1870, to Mr. Hanbury, who has favored us with the extract:

“You remember sending me some seeds of *Cinchona officinalis*. I sowed them and a good many germinated, but the plants were all lost save one. That plant is now 7 feet high and looking very healthy. Afterwards I got from Mr. Nieto about a hundred small plants of *C. Calisaya*, *C. succirubra* and *C. Condaminea*, which are all growing amazingly well. Some are already 12 feet high, with leaves from 10 to 15 inches long and wide in proportion. One three year old plant flowered at the house of Mr. Nieto, but I think this was premature and caused

by some impediment in the ground, as a large stone or some other obstruction with which the roots came in contact.

“In 1866, the late Emperor Maximilian obtained some cinchona seeds from England, which he distributed in this country. Mr. Nieto got the largest share of those seeds, and as he took great pains with them he raised thousands of plants, which he distributed to a number of persons. Of these plants the greater part were lost through injudicious management, so that actually only about 300 are alive, of which number I possess one-third.”

—*Pharm. Journ., Lond., Aug. 20, 1870.*

THE APPRENTICESHIP AND EARLY TRAINING OF PHARMACISTS.

BY F. BADEN BENDER.

The education question being one of the foremost and most important of the day, I trust that a few observations on the early training of those connected with our own vocation may not prove uninteresting to the members of this Conference. It must be evident to all those who have thought seriously on the subject that our present system of apprenticeship is inadequate to the higher standard of scientific education required in our calling. It has answered its purpose in the past, but requires modification to adapt it to the new pharmaceutical era.

Apprenticeships are, for the most part, served in small businesses, where pharmacy proper is subservient, and necessarily so, to less dignified but more remunerative employments. The proprietors are but too glad to add to their scanty incomes the premium received with a pupil, and they maintain the advantage by getting as much as possible out of him in the way of useful service. The leisure of some and the ability of others is too limited to afford much personal instruction or direction in scientific matters to those they have undertaken to instruct in the art and mystery of pharmacy; at the end of his term the youth has, we will assume, gained much useful information connected with his business; has taught his fingers to fold a parcel neatly, and his eye to guess a pennyworth of hair-oil in a Worcester sauce bottle, but in how few cases has he any accurate systematic

knowledge of even the elements of chemistry, botany, or *materia medica*! He then proceeds, at a very small salary, to one of those superior establishments where "neither apprentices nor arsenic are kept on the premises." At length it becomes necessary for him to pass an examination; his knowledge has increased, but it is a disorderly knowledge. If he has worked, he probably feels how much of his precious time he has wasted in working in wrong directions; he finds that, instead of getting, as he expected, more leisure for study as he grows older he gets less, and he sees no other course open to him but to cram under the direction of a professional crammer. A friend who has been prepared by Mr. So-and-so recommends that gentlemen's services, and night after night he crams his memory with formulæ, decompositions, diagrams, antidotes, natural orders, and very unnatural methods of keeping certain names and facts within reach for, say, ten days. With these, if he can keep calm, and does not lose his presence of mind at critical moments, he probably gets through. But this large meal of many courses disagrees with a mind not accustomed to generous diet; assimilation does not follow; a reaction takes place, accompanied by a lasting distaste for similar mental food, and by the time the holiday which usually follows a pass is over he has become confused as to his facts, and foggy as to his formulæ, but he thanks his stars that the ordeal is over.

The outline I have given of the studies and opportunities of the apprentices of the period, though happily contradicted by many bright examples, is, I believe, broadly true. Now this system, whilst it swells the ranks of pharmaceutical chemists, and adds to the funds of the Pharmaceutical Society, is not conducive to our real progress. We must remember that the knowledge which will be useful to a man is not that which he possesses on an examination day, but that which he retains afterwards. I think we may take it as a proven fact that very few apprentices do, or even can, qualify themselves during their term. The range of studies has become so wide that very much must be done either before or after, and the advantages of doing it first appear to me many and great. A boy who had received sound elementary instruction in chemistry, botany and *materia medica*

before entering upon his apprenticeship would be to a great extent self-dependent; it would then be entirely his own fault if he did not find daily opportunities of applying and increasing his knowledge; work which would have been mere irksome drudgery to him would be interesting and instructive, because he would find in it the application of principles and laws with which he had previously become familiar.

The next question is, how is this knowledge to be given? I think by the establishment of special technical schools for boys intending to become pharmacists. Mr. Schacht has estimated the number of young men entering the business annually as 1693. Is it too much to expect that a sufficiently large proportion of these to support the experiment would be able and willing to do so? The laboratories at Bloomsbury Square are overflowing; there is no lack of students now ready to spend money for knowledge which they would have found doubly useful if obtained earlier. There is reason to believe that our body will be recruited from a wealthier class than hitherto. A considerable sum will, in most cases, have to be expended one way or another, earlier or later, on the scientific education of the chemist if he is to attain, or, at any rate, to maintain a position, and I think the earlier in his career some of it is invested the better. Moreover, I am disposed to believe that some such plan as I propose would be in the end cheaper as well as better. A pupil having spent twelve months in this technical school would be a much more useful, or at least less troublesome, appendage to most businesses than the apprentice of to-day. Possibly some of the leading firms might be willing to take him at a more moderate premium. At the end of a three years' indenture he should pass the Minor with honors, and would then be certainly able to command higher remuneration than most men who have been four years in the business can now do.

I do not propose any detailed scheme, but make this suggestion in the hope that some of you may be able and willing to help its elaboration. The course of instruction should be elementary, but *thoroughly sound*, the main object being to set up signposts, warranted, as Mr. Ince says, to point in the right direction. When the apprentice sets up his own, they too com-

monly direct him by supposed short cuts, which lead him into all sorts of tangled difficulties. The teachers in the various departments should be men of real ability and experience. I have not much faith in the educating power of the "certificated science teacher," who is now ubiquitous. Much as we may respect a young man who, in addition to the practice of some honest handicraft, such as shoemaking, lectures on chemistry, botany, and one or two other branches of natural science, to the mechanics and artisans of his neighborhood, we may doubt if he is the most suitable person to influence boys better educated in ordinary subjects than himself. It is generally admitted that a thorough master of a science is required to impart quickly and accurately the rudiments of his subject, and these are what we want.

The establishment should possess a good museum of drugs and a garden of medicinal plants, and should be under the direction of a thoroughly practical pharmacist. How much might be learned by a boy in such a school in, say, twelve months! It should give him such an impetus as would last whilst he lived. How interesting to him would be the occasional half-hour's stroll in the country, for he should know much of physiological and something of systematic botany by that time! He would pursue his studies with the signposts full in view; and would he make a less successful business man for the scientific bias he had received? I think not. The acquirement of business tact would be just as necessary, but none the more difficult. Amongst the minor advantages to be derived from this proposed year's training may be mentioned the bond of fellowship which would be formed between kindred spirits, and which, thus early established, would greatly tend to the diffusion of pharmaceutical knowledge and the furtherance of the objects aimed at by our own Conference.

If the introduction of this subject brings about a discussion from which any more practical conclusions shall be derived, I have not wasted your time this morning.—*Proc. Brit. Pharm. Conf., in Lond. Pharm. Journ., Sept. 24, 1870.*

ON PERMANGANATE OF POTASSA.

BY B. HOWARD RAND, M.D.,

Professor of Chemistry in Jefferson Medical College.

This compound having become a popular "new remedy" with many practitioners, and having undoubtedly valuable as well as dangerous properties, I propose to discuss these in a few words.

The chemical nature of the salt need not be dwelt upon. Its method of preparation, with the chemical changes involved, will be found in the United States Dispensatory. It is enough to say that it is, perhaps, next to chromic acid or chloro-chromic acid, the most active oxidizing agent known. In contact with reducing agents or organic matter, it is instantly decomposed, becoming reduced to black oxide of manganese and caustic potassa. The oxygen given off appears to be, in great part, in the form of ozone, and rapidly attacks and burns up all varieties of organic matter, although some resist longer than others.

In consequence of this power of oxidation, it has been largely employed externally as a detergent and deodorizer, and internally in diseases in which an oxidizing agent is supposed to be indicated.

As to its value where used internally there is abundant testimony, yet, I fear, but little evidence. The enthusiasm with which a new remedy is employed by the practitioner seems to give faith to the patient, and "cures" follow which are properly recoveries. The same is true of secret remedies, which, however apparently successful, are generally abandoned when their true nature becomes known.

From its caustic character, permanganate of potassa is necessarily used internally in small doses,—that is, about half a grain. One grain of the salt is supposed by the chemist to be decomposed by five grains of ordinary organic matter, or half a grain by two and a half grains of the same. Suppose the permanganate to be given in solution in distilled water, the mixture made in absolutely clean vessels and dispensed from the same,—conditions very rarely fulfilled in practice,—we have the chance of its not meeting with two and a half grains of organic matter in its passage to the stomach. Then, considering the

organic contents of the stomach, and the fact that the tissues themselves are acted upon, we see how utterly impossible it is that any of the permanganate shall enter the circulation, there to give up its oxygen.

Moreover, as its color and taste, when in solution, are objectionable to most patients, some practitioners exhibit it in pill, in which form it is, in most cases, decomposed before it is swallowed. Dr. C. M. Fenn published, in the *Pacific Medical and Surgical Journal*, in 1867, a paper, which was largely copied, and is noticed in *Ranking's Abstract*, xlvii. 18, lauding the virtues of the permanganate in rheumatism, and giving successful cases. He gave half-grain doses in *raspberry syrup*. He believes that it converts lactic into carbonic acid. He certainly did not administer permanganate of potassa. Whether the black oxide of manganese and caustic potassa, which the patients did swallow, would convert lactic into carbonic acid, or otherwise cure rhumatism, we cannot say; but it is, at least, not probable.

For external use in many surgical cases, the permanganate of potassa possesses much value as a stimulating and deodorizing application. We owe to Mr. Condry, of Lond,* its introduction as a deodorizer. It is highly efficient, and at the same time is itself without smell. There are, however, a few practical points connected with its use which seem to be often neglected. It should not be applied to bandages or dressings, as it is decomposed by the organic matter of the fabric, and is lost; at the same time the dressings are discolored and rotted. It should not be applied with a sponge, for the same reason. Shallow dishes, containing a strong solution,—about one or two ounces to the pint,—allowed to stand in the sick-room, will be of much use in removing foul smells. It is not adapted to solid filth, although highly efficient, on account of the quantity required and consequent expense, but may be used with excellent effect in chamber-vessels, etc., after they have been emptied and rinsed.

A word as to economy. One ounce of the crystalized salt costs about as much as a pound of the crude, which is just as

* *Air and Water, their Impurities and Purification.* London, 1862.

good for deodorizing purposes. The crude gives a greenish solution, which even while cold, but more rapidly and completely upon boiling, passes into the deep red so characteristic of the permanganate, and is fit for use.

As a test for organic matter in air and water, its accuracy has been called in question, on the ground that it does not attack all kinds of organic matter with equal facility,—some, as starch, resisting its action for a long time. It must be admitted, however, that it is, at present, the only *practical* test that we have, and certainly shows very rapidly and clearly the presence of *hurtful* organic matter in water or in air. It can be applied by any one, it being only necessary to use a weak solution; the disappearance of the color indicates the presence of organic matter. In time of epidemics, such as cholera or dysentery, this test might be of much value in singling out the contaminated from the pure water. It is, perhaps, well also to recall the fact that this test forms the readiest means of purifying foul water. If added until the water acquires a permanent faint pink tinge, we are certain that injurious organic matter has been destroyed. Then, as Condry suggests, if a piece of clean stick be put into the liquid, or if a little tea or coffee be added, the pink color will disappear, and the water will be fit for use. The very small amount of potassa remaining in solution could not possibly do harm, as in any ordinary case it would not amount to one-hundreth part of a grain to the gallon.—*Med. Times, Phila. Oct. 15, 1870.*

NEW TEST SOLUTION FOR SUGAR.

J. Loewe recommends the use of glycerin in place of tartaric acid for the preparation of an alkaline copper solution for the detection of sugar. Glycerin entirely prevents the precipitation of oxide of copper, and the solution prepared with it has the advantage of being less liable to alteration when kept than the tartaric solution is.

To prepare a test liquid of this kind 16 grams of sulphate of copper should be dissolved in 64 parts of water; to this solution is gradually added 80 c.c. of soda solution (1.34 sp. gr.), then 6

or 8 grams of glycerin, which redissolves the hydrated oxide of copper that had been precipitated.

This liquid should not become turbid when diluted with two-thirds of bulk of water nor when boiled.

The copper solution may also be prepared by dissolving hydrated oxide of copper in a mixture of glycerin and caustic soda. The hydrated oxide is best obtained by adding soda solution to an ammoniacal solution of sulphate of copper, washing the precipitate and drying over oil of vitriol.

For 6 grams of this hydrated oxide there should be 6 or 8 grams of glycerin, 50 grams of water and 56 grams of soda solution of the strength above mentioned. This mixture is then diluted as may be requisite. The author prefers this solution to the other. It does not become turbid with alcohol.

The solutions will not bear considerable dilution without depositing hydrated oxide of copper, but this may be prevented by increasing the proportion of glycerin or of soda.—*Lond. Pharm. Journ.*, Sept. 3, 1870, from *Zeitschrift für analytische Chemie*.

NOTES ON THE CULTIVATION OF THE OPIUM POPPY IN AUSTRALIA.

By JOHN W. HOOD, Chemist, Melbourne.

This paper was communicated by Mr. T. N. R. Morson, together with the following letter addressed to the Chairman of the Liverpool Local Committee :

38 QUEEN'S SQUARE, W. C., Sept. 10, 1870.

My dear Mr. Abraham,—I this day send you the paper on Opium received last mail from Melbourne ; it is a highly interesting paper, and at the present time a very important one. I have no doubt that very good opium can be produced in Australia, and at a reasonable price. To the inhabitants of this part of the globe its home culture is very important, on account of the heavy duty on that imported from Europe. I have examined several samples sent me at various times, and although they varied very considerably in the quantity of morphia they contained, I consider them all to be *genuine opiums*.

I also send you the specimens I received per post with the paper. Please exhibit them. I should like to have them returned to me after the Conference is over. I wish to test some of them, and afterwards to send them to the Museum in Bloomsbury Square, in Mr. Hood's name.

T. N. R. MORSON.

The farmers in Victoria, for a good many years, have been touched with a desire to try new crops and new industries. Among the many ventures, suitable or unsuitable, was the cultivation of the poppy and the production of opium, which has been tried with varying success for the past four or five years.

I have felt some interest in this subject and have collected many samples from various districts, and also performed some rather crude experiments myself on the growth of the poppy, which I beg to submit. I feel that, perhaps, my conclusions may be of little value, but as I propose extending my investigations annually, I hope eventually to arrive at the best means of producing the greatest amount of opium together with richness in morphia, from a given quantity of poppy plants.

The first opium produced in any quantity in Victoria was at Sunbury, a village about twenty-two miles from Melbourne. Soil strong, rich, volcanic. It* was a good-looking opium; on analysis it only yielded some 2 per cent. of morphia, but contained an abnormal amount of other opium constituents, notably narcotine, of which there was about 8 per cent. I sent samples of this, and other opium from about the same locality, to T. N. R. Morson, Esq., who, as reported in the *Pharmaceutical Journal* for January, 1869, stated, "It was of great beauty as far as external characters were concerned, it had the perfect odor of good opium, and it dissolved with the Persian character, but, singular to say, it contained very little morphia, but a great abundance of the other principles known to exist in opium."

This opinion, from so well known an authority on all concerned with opium, of course reached Melbourne, and was published here with the effect of greatly discouraging the industry. However, a few did continue to plant and produce, and this last season probably a hundredweight and a half were brought into the market here, where it realized about thirty shillings (30s.) per lb., as it proved to be a very good opium, containing from 8 per cent. to 10 per cent. of morphia.

Mr. Morson's opinion being so much thought of, I sent him samples. His report being a favorable one, I had it published in the agricultural papers, and now some attention is again given

* Sample 1.

to the opium culture, and I expect that sufficient will shortly be made to enable a trial shipment to be made to London, as from the high price ruling for opium and its preparations it is very desirable that new sources of supply be discovered. With the beautiful climate and fine soil of Australia, eminently adapted for poppy-growing, enough opium should be produced to make a marked influence on the price in the European markets, as the growers here will be well paid at from ten to twelve shillings per pound; but as our consumption here is enormous, owing to the great number of Chinese colonists, it will probably be some years before the supply greatly exceeds the local demand.

I send herewith samples of opium from various localities, produced in 1867-8, 1868-9 and 1869-70.

The poppy is sown here in the months of June, July and early part of August, the opium being collected in the summer months of January, February and March. Most of the seed was obtained from Smyrna, and produces plants from five to seven feet high, each bearing three or four flowers of four large white petals. There is also some East Indian variety cultivated, with double purple or black flowers, but it is not popular, as it only has one flower on each plant and yields but little opium.

In 1868 I was desirous of ascertaining whether special manures or manner of culture had any influence on the amount of opium yielded and its richness in morphia, and, to determine it, made the following experiments:

I took six plots of virgin ground and treated them as follows:

Nos. 1 and 4 were manured with well decayed stable manure.

Nos. 2 and 5 were entirely without manure.

Nos. 3 and 6 were manured with spent lime from soft-soap works, containing about 3 per cent. of potash, and with Peruvian guano.

Each plot was the same size, and was drill-sown with the same lot of seeds on the following dates:

Nos. 1 and 2 sown on June 13th.

Nos. 3 and 4 " July 1st.

No. 5 " " 12th.

No. 6 " " 20th.

The plants were all above ground about ten days after each sowing, and about a fortnight after I thinned them out, leaving 150 plants on each plot. Plots 1, 3, 4 and 6 received no artificial irrigation, but depended for moisture entirely on the rainfall, while Nos. 2 and 5 were watered well every week until just before flowering. When ripe, I carefully cut the heads and collected the opium, obtaining the following yields:

No.	Yield of Opium in Grains.
1	153
2	177
3	159
4	171
5	189
6	203

The greatest yields were from Nos. 5 and 6, the last planted. Nos. 2 and 5, which were without manure, but with plenty of moisture, yielded much more than Nos. 1 and 4, those manured with stable manure. The opium was of the ordinary consistence, and, as far as possible, free from leaves or accidental impurities. Now, as to the richness of the samples in morphia.

On assay, from *one hundred* grains of each sample, well dried, I obtained:

No.	Grains of Morphia.
1	$4\frac{2}{10}$
2	$6\frac{3}{10}$
3	$6\frac{9}{10}$
4	$4\frac{6}{10}$
5	$6\frac{5}{10}$
6	$7\frac{1}{10}$

I also obtained a notable quantity of morphia from the aqueous extract of the bruised green heads from which the opium had previously been as far as possible extracted.

As the same seed, differently treated, give plants which yielded opium of different values, I naturally infer that manures, nature of soil, want of moisture, or excessive supply of water, and general manner of cultivation, have a great influence on the value of the opium produced. Last season (1869-70) I per-

formed the same experiments with relatively the same results. This year I hope to extend my operations and try many other manures, and have requested all who are growing opium to favor me with all particulars respecting manures, soil, mode of culture and collection and yield, and, if possible, a sample of the opium.

I cannot imagine my experiments as at all conclusive, as the differences might have occurred on different parts of the same ground; but if I find that treatment with stable manure, as a rule throughout the colony, gives a worse yield than if manured with guano, I may then reasonably think that Peruvian guano is more fit for manuring poppies than stable manure; and so on, until I arrive at the best manure and best method of cultivation of the poppy, so as to obtain the greatest and most valuable yield of opium.

Samples of opium accompanying this paper:

No. 1. Produced in 1867-8, from 80 poppies, at Sunbury, twenty-two miles from Melbourne.

No. 2. Produced in 1869-70, near Gisborne, thirty-two miles from Melbourne, on a river-flat of rich alluvial soil; yield 84 lbs. per acre.

No. 3. From near Bairnsdale, Gipp's Land, in a very cold climate; yield over 60 lbs. per acre.

No. 4. From near Gisborne, 1867-8; yield 50 lbs. per acre.

No. 5. Grown in 1868-9, at Soh Yarra, near Melbourne, collected and dried on tin plates, so that it is the pure juice dried.

No. 6. Grown in 1868-9, at Dromana, on the shores of Port Philip Bay, in very sandy soil; the produce of 420 plants.

Mr. DYMOND (Birmingham) observed that the plan adopted by the author, of cutting off the poppy capsules and then extracting the opium from them, was not that practised in the East. He had made experiments with garden poppies.

Mr. SUTTON (Norwich) said that some years ago a medical gentleman in his neighborhood grew a considerable number of poppies, and extracted opium by incision from day to day, but

the air-dried gum contained less than two per cent. of morphia. The season, however, was damp and somewhat cold, and this he (Mr. Sutton) believed was detrimental to the production of any large proportion of morphia. The question was really very little understood, but from experiments in various parts of the world it seemed an undoubted fact that fine, dry, warm weather produced, in any tolerable climate, a fair quality of opium; whereas, in a contrary season, the other and less valuable constituents (narcotine, &c.) were predominant. It was therefore probable that the effect of sunlight and warmth would be to convert a portion of these constituents into the more valuable form of morphia. He also stated that it was his intention to grow some poppies in his own district, should he be able to procure good seed, and also forward some to Australia, for the purpose of investigating the matter more fully.

Mr. DYMOND remarked that in his opinion we ought to go to Smyrna for seed.

Mr. BRADY said he understood some of the Norfolk specimens of opium contained a very large percentage of morphia. He believed it was considered impossible to produce opium on a large estate with a large staff of laborers; and in Asiatic Turkey poppies are grown for the purpose only by small farmers. The French had tried the growth of poppies in Algeria, but with little success, so that other conditions besides climate seemed to be requisite. The extract of poppy capsules had been found by Mr. Dean and himself to differ entirely from true opium in microscopic characters.

Mr. GROVES (Weymouth) expressed his belief that the production of opium was a continuous process of the incised poppy, and, therefore, that the proposal to obtain opium, or anything resembling it in strength, by expressing the unripe capsules, would prove delusive. He had, himself, on two occasions, examined carefully the ripe capsules. On the first occasion he had recovered sufficient alkaloids to justify further experiment. The second experiment was conducted upon 50 lbs. of crushed capsules. From that large quantity was obtained, narceia 23 grs., morphia 75 grs., narcotine 36 grs., codeia 33 grs. He had a

decided impression that the "crushed" capsules were inferior in quality to the "poppy-heads."—*Trans. of Brit. Conf. in Pharm. Journ., Lond., Oct. 1, 1870.*

A NEW ANTISEPTIC.

The hydrated chloride of aluminium, to which Mr. John Gamgee has recently drawn the attention of medical men and of the general public, appears to be a valuable antiseptic. It is quite as potent as chloride of zinc or carbolic acid, and is at the same time non-poisonous, and devoid of unpleasant smell of every kind. These qualities will no doubt insure its being extensively used, and at no distant date we may expect it to displace the antiseptics which are at present in vogue.

It is somewhat strange that this substance should have been so long overlooked as a possible antiseptic, and Mr. Gamgee certainly deserves credit for suggesting the utilisation of it for this purpose. The reason why it has been passed over is probably to be sought in its not being a waste product in any common chemical manufacture. The anhydrous chloride of aluminium, which is manufactured in order to serve for the preparation of metallic aluminium, is far too costly on account of the troublesome nature of the process by which it is prepared—to wit, by passing chlorine at high temperatures over a mixture of alumina and charcoal. By placing the anhydrous chloride of aluminium in water, it is of course converted into hydrated chloride.

The most economical process for the preparation of the hydrated chloride of aluminium appears to be by double decomposition between sulphate of alumina and chloride of calcium (both of which are cheap commercial products). When solutions of these two salts are mixed together, sulphate of lime is formed and appears as a precipitate, whilst the hydrated chloride of aluminium remains dissolved.

On allowing the aqueous solution to evaporate at a very gentle heat and afterwards cooling, crystals of hydrated chloride are produced. If an attempt be made to drive off the water from the hydrated chloride by the application of heat, decomposition will take place. Hydrochloric acid is evolved under these con-

ditions, and oxy-chloride of aluminium is formed, and by pushing the process, alumina is obtained as the ultimate fixed product.—*Med. Gaz., New York, Sept. 24, 1870, from Lancet.*

ANCIENT USE OF ODORIFEROUS PLANTS.

In his introductory address to the Medical Section of the British Medical Association at their late meeting at Newcastle-upon-Tyne, Dr. Rumsey, referring to a remarkable series of observations which Professor Mantegazza has reported to the Institute of Lombardy, made the following remarks :

“The experiments were not made under the dull sky of Britain, but in sunny Italy. We have all heard how Acron of Agrigentum, and other followers of Empedocles the physicist, employed aromatic and balsamic herbs as preventives of pestilence, often burning them, sometimes planting them round their cities. So also Herodian records (*Langius Jo., Florilegium, Morbus*, p. 1854; Lugduni, 1648) that, in a plague which devastated Italy in the second century—the counsel of the doctors having been taken—strangers crowding into Rome were directed to retreat to Laurentum, now San Lorenzo, that by a cooler atmosphere, *and by the odor of laurel*, they might escape the danger of infection. Some of us may have smiled at the latter part of the advice. Could the scent of herbs and flowers do more than conceal the presence of infectious matter in the air? Mantegazza now replies in the affirmative. He says that in the oxidation of the essences of odoriferous plants a large quantity of ozone is evolved, at least as much as is produced by phosphorus or electricity; also that, in the greater number of these cases, ozone is developed only by the direct rays of the sun, although in others the action, commencing in solar light, is found to continue in darkness. Some details of these interesting experiments have appeared in the scientific periodicals, so I need only mention that among the plants which largely develop ozone on exposure to the rays of the sun, are cherry-laurel, clove and lavender; among flowers, the narcissus, hyacinth and mignonne; and among perfumes, similarly exposed, eau de Cologne, oil of bergamot and some aromatic tinctures. Flowers destitute

of perfume are said *not* to produce ozone. The professor, therefore, recommends the cultivation of herbs and odorous flowers *in marshy districts and in places infected with animal emanations.*

“The destruction of the demon Malaria, by a spirit begotten by sunlight out of flowers—if it be confirmed by subsequent observation—not only explains the good effects of what might seem to have been merely speculative or empirical advice, but also affords a beautiful confirmation of an ancient myth by modern science. When Apollo the Healer, by his life-inspiring and health-restoring rays, penetrates the loveliest objects in creation, and draws forth from them a mysterious purifier—a mighty but invisible disinfectant,—the god of medicine may be said to administer to a plague-stricken people a most potent remedy concealed in the most grateful and attractive forms.”—*Pharm. Journ., Lond., Sept. 3, 1870.*

GUARANA—*PAULLINIA SORBILIS*, MART.

By M. C. COOKE, M.A.

The remarkable product called Guarana has not been many years known in Europe. The tree whence it is obtained belongs to the Order *Sapindaceæ*, and is abundant in the province of Amazonas, along the banks of the Tapajos, Rio Negro, etc., as well as in Guiana and Venezuela. The fruit, scarcely as large as a walnut, contains five or six seeds, which are roasted, then mixed with water, and moulded into a cylindrical form resembling a large sausage, then finally dried in an oven and offered for sale. Guarana is used extensively in Brazil, Guatemala, Costa Rica, and other parts of South America, as a nervous stimulant and restorative.

Besides its medicinal properties, this substance has a reputation for affording a refreshing beverage similar in its effects to tea and coffee. It is grated into a powder, very like powdered cacao in appearance. Two spoonfuls of this powder are mixed in a tumbler of water, and this drink is regarded as a stimulant to the nerves, and, like strong tea or coffee, is said to take away the disposition to sleep.

The active chemical principle is an alkaloid first discovered

by Dr. Theodore von Martius, and called by him Guaranine, but since shown by Dr. Stenhouse to be identical with Theine. Guarana contains more than double as much of this alkaloid as good black tea, and five times as much as coffee, the proportions being 5·07 per cent. in Guarana, 2·13 per cent. in tea, and 0·80 to 1·00 in coffee.* The same alkaloid is found to the amount of 1·25 per cent. in matè, or Paraguay tea, the produce of several species of *Ilex*.

It is rather a singular coincidence that the same alkaloid should prevail in all the principal substances employed in a similar manner as beverages in different parts of the world,—in the tea of China and India, the coffee of Arabia, the cacao of Central America, the matè of South America, and the Guarana of Brazil. M. Fournier has found in the last named substance, besides tannate of caffen, the following principles: gum, starch, an acrid green fixed oil, a concrete volatile oil, scarcely soluble in water, a peculiar principle not precisely determined, and tannic acid.†

According to the 'Technologist,' there is exported annually from the city of Santarem about 16,000 lbs. of this substance, valued at eightpence or ninepence per pound, and on the Rio Negro it has been sold as low as one penny per pound. Specimens were exhibited in the Brazilian Court of the International Exhibition of 1862, made by the Amazonian Indians, who prepare it for their own use, and for conveyance to Para, Matto Grosso, and Goyaz. Six different preparations made in Vienna from this substance were also shown in the Austrian Court.

When Guarana was first employed in France medicinally, it sold at the rate at from four shillings to twenty shillings per ounce, but has since gone down in price. It is included amongst the non-official substances of the 'United States Dispensatory.'

Its effects upon the system are said to be those of a tonic, but they do not appear to have been accurately investigated. It is habitually employed by the Indians of Brazil, either mixed with

* For an account of Dr. Stenhouse's researches, see *Pharm. Journ.* 1st ser. Vol. XVI. p. 212.

† *Journ. de Pharm.*, April 1861, p. 291.

articles of diet as with cassava or chocolate, or in the form of drink, prepared by scraping it, and suspending the powder in sweetened water. It is considered by them useful in the prevention and cure of bowel complaints. Dr. Gavrelle, who was formerly physician to Dom Pedro, in Brazil, called the attention of the profession to it some years since in France. He had found it advantageous in the diarrhœa of phthisis, sick headache, paralysis, tedious convalescence, and generally as a tonic. By Dr. Ritchie, surgeon in the British Navy, it is highly recommended in irritation of the urinary passages.* Dr. Hervé has been in the habit of using it daily for five or six years, and has never failed to derive advantage from it in idiopathic diarrhœa, even in the most obstinate cases.†

It may be given in substance, in the quantity of one or two drachms, scraped into powder, and mixed with sweetened water, but the most convenient form of administration is that of spirituous extract. According to M. Dechastelus, alcohol is the only agent which completely extracts its virtues, ether and water effecting this object but partially. Of the extract eight or ten grains may be given during the day, in the form of pill. It may also be taken along with chocolate as a drink.‡

Another species of *Paullinia* (*P. cupana*) growing on the banks of the Orinoco river, is also said to yield a similar substance. Guarana, or Paullinia, as it is sometimes called, has never obtained general favor in this country.—*Pharm. Journ.*, London, Sept. 17, 1870.

IRON AND HYDROGEN.

BY DR. KLEIN.

The author, a pupil and collaborator of Professor Jacobi, of St. Petersburg, states, that the iron obtained by electrolysis is not, as has been often thought, the pure metal, but, on the contrary, a compound or mixture of iron and hydrogen, which, when heated to redness, gives off an enormous amount of that gas, and becomes, while greatly increasing in bulk, a silver-white, very

* *Ed. Month. Journ. Med. Sc.* N.S. v. p. 467.

† *Brit. and For. Med. Chir. Rev.*, Jan. 1858, p. 192.

‡ *United States Dispensatory*, 12th ed. p. 1578.

soft ductile, and malleable metal, which decomposes water readily below its boiling-point and oxidises most rapidly.—*Lond. Chem. News, Sept. 23, 1870.*

A VEHICLE FOR THE INTERNAL ADMINISTRATION OF CHLOROFORM.

To the Editor of the Medical Record :

The want has been felt by many physicians of a good vehicle for the internal administration of chloroform. Several formulæ have been devised to meet this, but none, that I have seen, do so perfectly. Some are of difficult preparation; others contain sulphuric ether, which is objectionable, and all contain too little chloroform for convenience.

I have lately been using a solution of chloroform in glycerin, which answers the purpose so completely as to leave little to be desired. By a little care in rubbing it up, one part of chloroform by bulk can be dissolved in three of glycerin. This solution is perfectly clear, is bland to the taste, and has but a slight odor of chloroform.

As glycerin is acceptable to almost every stomach, it admits of a wide range of application. It can be taken readily as it is, or can be diluted with water to any extent, without disturbing the solution. Curiously enough, the addition of water immediately increases the smell of chloroform without any precipitation of it. In preparing it, it is best to take one part of chloroform with two parts of glycerin, add the chloroform very slowly, and rub up carefully. Then put it in a bottle, and let it stand twenty-four hours. A little chloroform will have deposited at the bottom. Separate this, and rub it up with the third part of glycerin, then mix it with the rest, and the solution is complete. No further separation will take place. Six ounces of glycerin with two of chloroform will give seven fluidounces of the solution, so that each fluidrachm contains about seventeen M. of chloroform.

From the faint odor of the prepared solution I judge that the glycerin protects it almost entirely from evaporation, although some slight loss may occur while preparing it, which it might be well to make allowance for.

I have used only Squibb's chloroform and pure article of glycerin, and cannot say how inferior grades may answer.

Having used it in a large variety of cases with entire satisfaction, I can confidently recommend it to others.

Respectfully,

G. WILSON MURDOCK, M.D.

Cold Spring, N. Y., April 30, 1870.

—*Medical Record*, N. Y.

ON WAX MILK.

BY HERMAN KOCH.

To the Druggists' Circular:

After carefully perusing the article on wax milk, contained in the July issue of your Journal, I concluded to try the experiment of making and using the article named, but found the result very unsatisfactory. I find that this so-called wax-milk in the first place does not contain wax enough for most practical purposes, and that furthermore its corrosive, alkaline nature will interfere with many uses, such, for instance, as renovating finely polished furniture, picture frames, etc. If paper is to be impregnated by means of this milk, several coats are required which dry slowly, and on account of the friction in applying the same are very apt, especially in the place of glazed or sized paper, to destroy the smooth surface. The necessity of immersing the sheets in water to remove the uncombined alkali is an additional objection to this process.

After having obtained the above results I concluded to try other "solvents" of beeswax, which, while not too expensive, would evaporate without leaving any smell or residue behind. Turpentine I found defective in both these particulars, especially when not quite fresh.

Benzine will dissolve a large proportion of wax, especially when heated to the boiling point, which can be easily effected without danger of explosion, by placing a bottle containing the liquid in water heated to between 150 and 200 degrees F. The solution, however, will deposit a cloudy sediment upon cooling. Nevertheless, it can be readily used for producing wax paper, or

in fact, for all manipulations where the object is to produce a thin uniform coating of wax on any foreign substance. The benzine evaporates completely inside of a few hours without leaving a trace of smell behind.

The best solvent, however, I found to be bisulphide of carbon. This substance readily produces a concentrated clear solution of wax, even without the aid of heat, and evaporates so quickly, that wax paper produced by its aid is ready for use within a few minutes after being impregnated. This latter manipulation should be performed quickly and on both sides by means of a soft sponge.

This solution will be found especially adapted for coating gypsum statuettes and other similar work.

It may also be used for closing up small cracks in furniture prior to being varnished or painted, as also for bedsteads to exclude bed bugs, For the former purpose it may be colored to harmonize with the furniture.

The use of this "Wax Varnish" will be found very convenient, especially during the summer months, when gas, stoves and charcoal furnaces are in general use, which will not produce the uniform heat over a large surface that is necessary to make good wax paper according to the usual plan.

Cincinnati, August, 27, 1870.

Drug. Circ. & Chem. Gaz. Oct., 1870.

REPORT ON OPIUM PRODUCTION IN WURTEMBERG.

BY JULIUS JOBST.

The author states in this report the results of this year as follow :

Though large quantities of poppies were sown last spring, the crop rarely did well in consequence of the continued dry weather. This alone put an end to any prospect of considerable development in opium cultivation for the present year, and the scarcity of laborers at the time of gathering was for a time a further hindrance. Subsequently, when the influence of the war had driven many to this work, the best time for collection was past, and the poppies ripened too quickly, owing to the great heat.

On the contrary, the price of the new Asiatic opium admitted of the best Würtemberg opium fetching as much as 34s. per pound. At this price the earnings of a laborer would amount to 2s. 6d. a day, which is good, considering that old men, women and children could be employed for the purpose.

The opium of this year is much superior to that previously grown. The amount of morphia it contains is 12 per cent., even in samples that are somewhat moist.—*Lond. Pharm. Journ.*, Oct. 15, 1870, from *Gewerbeblatt aus Würtemberg*.

Minutes of the Philadelphia College of Pharmacy.

A stated meeting of the Philadelphia College of Pharmacy was held at the College Hall, September 26, 1870, at 3½ o'clock, P. M. Dillwyn Parrish, President, in the Chair, and twenty-four members present.

The minutes of the previous meeting of the College were read and approved.

The minutes of the Board of Trustees were read by Alfred B. Taylor, Secretary of the Board, and approved.

The Committee on Latin Labels, to whom was referred the subject of a new edition of labels, not being ready to report, was continued.

The delegates to the American Pharmaceutical Association presented the following report:

"The delegates appointed in June last to attend the American Pharmaceutical Association report, that at the time appointed it became apparent two of the delegates would not be able to attend, when the name of James T. Shinn for Charles Bullock, and Henry N. Rittenhouse for Thomas S. Wiegand, were substituted.

The meeting convened at the University of Maryland about the time appointed; E. H. Sargent, of Chicago, President, and Prof. Maisch, Secretary. Soon after the meeting was organized it was resolved that a telegram of fraternal greeting be sent to the meeting of the British Conference at Liverpool, then in session, and in the evening a similar telegraphic message came from the Conference, which had been sent before the reception of the Baltimore telegram.

The annual address of the President was listened to with considerable interest; among the facts mentioned was, that the membership, without the additions of the present meeting, is set down at 831. The Committee on Nominations was appointed at this sitting. At the second meeting a ballot was held, which resulted in the election of Richard H. Stabler, of Alexandria, Va., as *President*, and of Flemming G. Grieve, of Georgia, George G. Steele, of California, and Eugene L. Massot, of Missouri, for

Vice-Presidents. T. S. Wiegand as Chairman of the Executive Committee, and William T. Wenzell as Chairman of the Committee on the progress of Pharmacy.

The report of Dr. F. Mahla, of Chicago, on the progress of pharmacy was, as usual, an extensive document, involving much labor and research. No report was made by the Committee on the Drug Market, this being the second year that this committee has failed to do its duty. The number of special reports to queries was very deficient, more than half of the reporters having failed to reply. Several excellent volunteer papers were read, among which, that of Dr. E. R. Squibb on fluid extracts, and on percolation as a means of producing them, was the most important. Dr. Squibb also made a valuable verbal communication on the manufacture and characteristics of chloral, by request.

Among the special committees appointed to act in the interim, was one on adulterations and sophistications; another to compile a new General Index to the Proceedings; another to consider and report next year on the suggestion to invite the International Congress of Pharmacutists to meet in the United States in the year 1876, the Centennial Anniversary of our Government; a fourth, on pharmaceutical legislation, and a fifth, to draft and send an address of felicitation to the North German Apothecaries' Association on the occasion of its 50th anniversary.

On the afternoon of the third day, the meeting adjourned to meet in St. Louis on the second Tuesday in September, 1871.

It would be improper to pass over unnoticed the exhibition of chemical and pharmaceutical preparations and apparatus held during the sessions in the University building, which was a decided success; as also, to testify to the courtesy and hospitality extended to the visiting members by their brethren of the Monumental city."

Signed on behalf of the delegates by William Procter, Jr.

The report was accepted and referred for publication with the minutes.

William Procter, Jr., on behalf of the delegates to the Baltimore Educational Conference, made a verbal report, which he was requested to write out for publication in the minutes.

"The delegates convened by the call of the Maryland College of Pharmacy met in the Hall of that College, at Baltimore, on the 14th and 15th of September, 1870. Representatives were present from the Maryland College, the New York College, the Chicago College, the New Jersey Pharmaceutical Association, California Pharmaceutical Society, the Philadelphia College and the Massachusetts College. The meeting was organized by the election of Joseph Roberts, of Baltimore, *President*, and Prof. J. F. Moore, of Baltimore, *Secretary*, (William Wright, Jr., of New York, acting Secretary *pro tempore*.) The business was opened by the reading of a series of queries which embraced the objects of the meeting. [See page 501 for these and the details of the proceedings.] The discussion of these queries *serialim* occupied most of the time of the Convention, and resulted in the adoption of the following resolutions:

Resolved, That in the opinion of the Convention more attention to the preliminary education of those who propose to enter the business of pharmaceutists is needed, and it is earnestly recommended to the colleges and societies of pharmacy to urge their members and the profession of the United States generally, to give greater care to this subject in taking apprentices.

Resolved, That we recommend that apprentices should not be taken under sixteen years of age, and shall be twenty-one years of age before being entitled to receive their diploma.

Resolved, That the branches to be taught in Colleges of Pharmacy should, *at least*, include lectures on general chemistry, elementary botany, materia medica, and the general facts and principles of pharmacy, and, when practicable, opportunity should also be provided for instruction in practical and analytical chemistry.

Resolved, That it is earnestly recommended, that whatever method [of examination for graduation] be adopted should include questions, both oral and written, and that particularly a familiarity with the physical properties of specimens should be insisted on.

Resolved, That diplomas should not be recognized as evidence of sufficient qualification unless based on four years' practical service in the dispensing shop.

Resolved, That each college be requested to take action on the questions presented at this Convention, and report to this body at its next meeting.

The Convention adopted a resolution looking to a permanent organization to meet annually at the time and place of the meetings of the American Pharmaceutical Association, with a President and Secretary as officers."

T. S. Wiegand, chairman of the Sinking Fund Committee, informed that the committee had nothing to report since last meeting.

The Committee on Deceased Members read the following sketch of our late member Alexander Fullerton, Jr.

"Alexander Fullerton, Jr., was the only son of Alexander Fullerton, a respectable Philadelphian of the old school. He was born September 24, 1796, was educated in his native city, and being designed for the business of a druggist, was placed in the store of W. Heyl, 205 High street, with whom, and his partner Mr. Wykoff, he completed the usual term of his apprenticeship, and remained for some years after attaining his majority. About the year 1823 he established himself in business with John Claxton, under the firm of Fullerton & Claxton, and after the year 1835, continued on his own account at the well remembered stand 174 Market street, (old number,) until he was succeeded by the firm of Moyer & Hazard.

His strict attention to business, and well known integrity, brought him a large share of trade, but increased competition and the gradual change

in business habits induced him to retire when he had acquired a moderate competence, and to devote himself to works of public beneficence. He was for many years a trustee of the First Presbyterian church of Philadelphia, and was also treasurer of the Asylum for feeble minded children at Media, Pennsylvania. It was, however, as Manager of the House of Refuge for juvenile delinquents that he found the largest sphere for his public spirited labors. He was married in 1830. His wife, two sons and two daughters survived him. He died May 12, 1868. He was one of the original members of this College, and served as one of the trustees for a number of years."

Samuel F. Troth presented to the College a [record] book, kept by himself for a period of nearly forty years, containing valuable statistics regarding the College.

On motion of E. Parrish, a vote of thanks was unanimously tendered for the present, and Samuel F. Troth respectfully requested to fill up to the present time in his own hand the list of members and graduates.

The committee appointed to inquire concerning F. F. Muller, of San Antonio, Texas, proposed for membership at last meeting, having reported satisfactorily, a ballot was ordered, which resulted in his election to membership.

William Procter, Jr., presented, in the name of Daniel Hanbury, of London, honorary member of the College, a large engraving of the late Jacob Bell, founder of the Pharmaceutical Society, also a photograph of the old Plough Court Laboratory, which were accepted, and the thanks of the College returned to Mr. Hanbury.

A remarkably fine specimen of *Polygala senega*, the entire plant dried so as to retain the color of the flowers and leaves, was presented by the same in the name of Edward S. Wayne, of Cincinnati.

Also, several fine specimens of refined sugar from Daniel McKean & Co., successors to Jos. S. Lovering & Co., for both of which the thanks of the College were voted, and the specimens put in the museum of the College.

The annual election of eight trustees being ordered, the following were elected :

W. H. Pile, M.D.,

H. N. Rittenhouse,

W. J. Jenks,

E. Parrish,

A. B. Taylor,

W. C. Bakes,

Evan T. Ellis,

Charles Shivers,

W. Procter, Jr., as Editor of the American Journal of Pharmacy, made a statement regarding the present business management of the Journal, and suggested the appointment of a committee of business men to confer with the Publishing Committee.

After some discussion, the following resolution was adopted :

Resolved, That a committee of three members be appointed to confer with the Committee of Publication regarding the business transactions

of the Journal in all its bearings, and report to the next meeting of the College.

The Chair appointed James T. Shinn, Robert Shoemaker, and Charles Bullock as the committee.

Prof. Maisch made an appeal for the Pharmaceutical meetings, commencing the third Tuesday in October, at eight o'clock, P. M.; and Dr. Pile, the Registrar, was requested to send notices of the meeting to the members generally.

The committee on deceased members was re-elected for the ensuing year.

On motion of Robert England, the plan of having printed voting slips be adopted at the semi-annual as at the annual meeting.

On motion, then adjourned.

CHARLES BULLOCK, *Secretary*.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT BALTIMORE.—The minutes of this body will be found in the beginning of this number, and will convey to the reader a better idea of the meeting than any notice we can give here. On the whole, it was a pleasant, quiet gathering, adding to our numbers largely, and extending fraternal feeling among the members.

EXHIBITION OF CHEMICALS AND DRUGS.—The large room over that in which the Association met was devoted to the exhibition of drugs, chemicals and apparatus. So much time has elapsed since the meeting that interest in this department has greatly abated, yet, as promised in our news sheet for October, the following abstract is put on record, mainly taken from the Baltimore Gazette, as we have been unable to avail ourselves of the official report.

SPECIMENS OF CHEMICAL PRODUCTS, PHARMACEUTICAL PREPARATIONS, &c.—Messrs. Powers & Weightman, of Philadelphia, exhibited the largest and most complete assortment of specimens to be found within the hall. Among their collection of chemical products were noticed several large and beautiful specimens of crystalized alum and sulphate of copper, and specimens of nitrate of silver of unusually large size and purity. Two glass cases containing sulphate of morphia and sulphate of quinine, weighing about sixty ounces each, attracted special attention. Other specimens were displayed in great variety.

Messrs. Rosengarten & Sons, of Philadelphia, exhibited a handsome collection of chemicals, prominent among which were beautiful specimens of piperin, permanganate of potassium, crystallized strychnia, ammonio-citrate of bismuth, chromic acid and sulphate of cinchonia.

Messrs. Charles T. White & Co., of New York, deposited interesting specimens of iodide of potassium, bromide of potassium, pyrophosphate

of iron, valerianic acid, chemically pure mineral acids and pure acetic acid.

Mr. E. Schering, of Berlin, Prussia, through his agents in New York, exhibited specimens of hydrate of chloral and per chloride of iron, beautifully crystallized.

Messrs. Thomsen & Block, of Baltimore, had on deposit a fine display of pure Epsom salts and other drugs and chemicals.

Mr. Wm. Davidson, of the Baltimore Chemical Works, exhibited fine specimens of acetate of lead and acetic acid, manufactured at the Harford Furnace Chemical Works, Harford county, Md., also, Merck's phosphoric acid in sticks, and specimen crystals of iodide of potassium and bromide of potassium, and various other rare chemicals.

The Baltimore Chrome Works had on exhibition large specimens of crystallized bichromate of potassium, orange red color, together with chrome ore from which the salt is prepared.

Messrs. Adams & Drexel, Baltimore, had a fine display of druggists' glass labels and sundries.

Messrs. McKesson & Robbins, of New York, had an extensive display of pure drugs of all kinds, including gelatin-coated pills.

Messrs. Hance Bros. & White, of Philadelphia, exhibited extracts of all kinds, both fluid and solid, and various kinds of healing plasters.

Mr. S. Mason McCollin displayed a collection of pharmaceutical preparations and flavoring extracts.

The Phoenix Glass Works of Baltimore had a magnificent assortment of druggists' glass ware in white, blue and green colors.

Messrs. Mellor & Rittenhouse, of Philadelphia, presented an assortment of fluid extracts, essences and essential oils.

Messrs. Bullock & Crenshaw, of Philadelphia, exhibited a magnificent display of sugar-coated pills and granules.

Mr. Jeremiah Quinlan, of New York, displayed elegant and chaste glass labels and druggists' sundries.

Mr. Wm. C. Bakes, of Philadelphia, had an extensive assortment of pharmaceutical preparations and improved pestle and mortar worked by hand power.

Mr. John Matthews, of New York, exhibited a superb soda fountain of mottled marble and silver mountings, constructed in the Gothic style of architecture, valued at \$1,200.

Messrs. Wm. R. Warner & Co., of Philadelphia, displayed beautiful specimens of sugar-coated pills.

Messrs. Hartman, Laist & Co., of Cincinnati, Ohio, had on deposit fine specimens of glycerin and Epsom salts.

Messrs. Samuel Campbell & Co., of Philadelphia, exhibited a complete assortment of superior perfumes and pharmaceutical specialties.

Mr. Edward Parrish, of Philadelphia, a similar collection.

Mr. Robert Shoemaker, of Philadelphia, displayed a large assortment of pulverized drugs.

Messrs. Sharp & Dohme, of Baltimore, exhibited fluid extracts, pharmaceutical preparations and specialties.

Messrs. N. Hynson Jennings & Co., had on deposit an extensive assortment of pharmaceutical specialties, sherry kino and a beautiful collection of pure perfumes.

Messrs. Andrews & Thompson, of Baltimore, displayed among other articles, specimens of pyro-phosphate of iron, chloride of potassium, citrate of iron and hypophosphate of manganese.

Messrs. Burrough Bros., Baltimore, exhibited the most complete assortment of fluid extracts in the hall.

Dr. Wilson H. Pile, of Philadelphia, deposited thermometers, hydrometers, &c., and Mr. H. Troemner, of the same city, an improved drug mill.

The collection throughout was pronounced to be one of the most complete that has ever been presented at a meeting of the Association.

Besides these specimens were many not enumerated and various objects of interest which our space will not permit us to dwell upon. The collection of McKesson & Robbins was particularly interesting. Among the novelties not heretofore exhibited was a collection illustrative of how the microscope can be useful to the pharmacist.

Dr. Frederick Hoffman, of New York, exhibited a choice selection of microscopic objects of medicinal drugs and articles of food. The microscope is now deemed indispensable to the educated pharmacist; its application to the examination of drugs, of pharmaceutical preparations as well as of articles of commerce and of domestic use, has become general. A collection of reliable specimens of microscopical preparations of medicinal drugs, of their adulterations or accidental or fraudulent admixture, is of great service to the pharmacist for comparative examination, as well as for the instruction of apprentices and clerks.

Such preparations require not only much time and leisure, but also a degree of manipulative skill and practice not easily attained; therefore the preparation and sale of microscopical objects of drugs by some practiced pharmaceutical preparers has met with due approval.

The objects exhibited were mostly prepared by Mr. C. Rodig, in Hamburg, Germany, and were of great excellence. They were mounted either in Canada balsam or in glycerin, or glycerin with additions of alcohol, phenol, chlorides, &c., according to the nature of the object. Specimens of barks, wood and roots were in many cases represented in vertical, in radial and transverse sections.

THE EXCURSION ON FRIDAY AFTERNOON AND EVENING was a perfect success. Notwithstanding the expressed wish of the meeting at Chicago, the Pharmacutists of Baltimore determined to extend their usual liberal hospitality to the visiting members by an excursion down the bay to Annapolis, in the steamer *Champion*, and a supper at Holly Grove, near North Point. Between three and four hundred members and their friends were on the boat, which was not crowded, and was admirably fitted for the purpose. An excellent band of musicians added to the entertainment, and throughout nothing occurred to mar the most perfect comfort and enjoyment of the excursion. At Annapolis permission was obtained to stop at the Government wharf and visit the museum buildings and grounds of the United States Naval Academy, and at Holly Grove, after partaking of a sumptuous supper, rendered comfortable by ample accommodations, some of the ladies of the company and their friends enjoyed themselves in those light fantastic movements in which they delight to partake. At 9 o'clock, P. M., the steamer's whistle called all aboard, and an hour afterwards, during which various speeches and resolutions were passed, and much hilarity exhibited, the company left the vessel deeply impressed with the complete and perfect manner in which their Baltimore friends had extended their hospitality.

THE BRITISH PHARMACEUTICAL CONFERENCE MEETING.—This body met in the Royal Institution building, Colquitt street, Liverpool, at 10 o'clock, A. M., on Tuesday, the 13th of September, Mr. W. W. Stoddart, President. As a preliminary step, 920 candidates for membership were duly elected by ballot, making the members of the Conference number about 1,500. The report of the executive committee exhibits the fact that an active canvass for members throughout the country had produced the large additional membership. The report announces that the year book, under the editorship of Mr. Brough, may be expected about December 1st. It also informs of the liberal donation of Thomas Hyde Hills, of a check for fifty guineas, to promote the objects of the Association. Delegates were in attendance from the local associations at Bristol, Nottingham, Edinburgh, Manchester, London, Ashton and Dunkinfield, Scarborough, Leeds, Bradford, Sunderland, Bath, Brighton, and Newcastle-on-Tyne. Prof. Carlos Murray, of Buenos Ayres; Prof. Soubeiran, of Paris, and Senor Joachim Correo de Mello, of Brazil, were elected foreign members. The President delivered a long and interesting address, full of scientific facts, and concluding with a well merited eulogium on the Secretaries and Treasurer, Messrs. Attfield, Reynolds and Brady.

In the evening, after this session, the President and officers were entertained by the local committee by a dinner at the Adelphi Hotel, the party numbering more than one hundred, which was conducted in true English style, with toasts and repartee. It was from this social meeting of the officers that the telegram received by the Baltimore meeting emanated.

The Treasurer's report was read, and a committee appointed on the Exhibition, when the following papers were read, viz.: On the Purity of Yellow Bees Wax of Pharmacy, by Edward Davies; on Saccharo-Chirettin, by D. S. Kemp, of Bombay; on the Strength of 24 Specimens of Saccharated Carbonate of Iron; on an Apparatus for Regulating Heat, and on the Apprenticeship and Early Training of Pharmacists, by F. Baden Benger; Notes on the Cultivation of the Opium Poppy in Australia, by John W. Wood; Analysis of Bitter Cassava Juice, by Professor Attfield; on the so-called Citrate of Magnesia, of Pharmacy, by F. M. Rimmington, on the Specific Gravity and Actual Weight of Certain Volume Measures of Various Liquids, by the same, and on Decoction of Sarsaparilla, by the same.

When the Conference re-assembled at 10 o'clock, on Wednesday morning, September 14th, Prof. Attfield stated that an answer had been received from the American Pharmaceutical Association, in conference at Baltimore. After some usual business, the reading of papers was resumed in taking up a long essay by Mr. Joseph Ince, on "A Century of Old Books Relating to Pharmacy." This is the extent of the proceedings received through the Pharmaceutical journals, which print the proceedings by short instalments.

OUR JOURNAL.—With this number ends the forty-second volume of the *American Journal of Pharmacy*; and it may be well to say a few words in regard to the future. For some time past the plan of making the *Journal* a *Monthly* has been entertained, a change proposed in harmony with the prevailing idea of frequent issues in scientific serials. If this is carried out, it is the intention of the Publishing Committee to make a complete change in the organization of the business department of the *Journal*, and especially in reference to its facilities and value as an advertising medium, to accomplish which it is proposed to have a *Business Editor*, who shall have charge of the entire business of the *Journal*, advertising sheet, accounts, finances, distribution and custody of the stock; and who shall have his office at the College Hall, where all business in relation to the *Journal* will be transacted. Although this arrangement has the entire approval of the present Editor, in view of the best interests of the *Journal* and the College, and, in fact, was suggested by him, yet he believes the time is drawing near when it will be right for him to retire from the helm which he has so long guided in the varying sunshine and gloom of its career, and let some younger and more efficient worker take his place. It is more than one-third of a century since his connection with its pages, as a contributor, commenced, during twenty-five years of which his services as Editor have been continuous; and, though much of this time it has been a labor of love, he believes that now he is entitled to a season of rest from the pressure of responsibility which ever attends faithful editorial service.

NEW CHAPTER IN THE HISTORY OF CHLOROFORM.—We learn from the *Pharmaceutical Journal* of Oct. 15th that Mr. George Waldie, a chemist and druggist of Linlithgow, Scotland, has published a pamphlet entitled, "the true story of the introduction of chloroform into anæsthetics." In this pamphlet Mr. Waldie claims for his brother, David Waldie, now of Barnagore, Calcutta, much of the credit due for the discovery of the anæsthetic properties of chloroform. The account given by David Waldie, himself, of his share in the discovery is as follows:

"On the occasion of a visit to Dr. Simpson, when in Scotland, in 1847, he spoke to me of his trial of various vapors, in his endeavors to discover something else than ether, at that time employed to some extent for anæsthetic purposes, amongst others mentioning chloric ether, the chemical constitution of which he was evidently not aware of. This I explained to him, showing him that it was chiefly vapor of alcohol that would be inhaled, and advised him to try pure chloroform, which appeared to me likely to be suitable. I promised, also, to prepare some as soon as I could on my return to Liverpool and send it to him for trial."

On returning to Liverpool the destruction by fire of the Apothecaries Company's Laboratory, where Mr. Waldie was an operator, prevented him from giving attention to the matter, when sometime after he read the announcement that Dr. Simpson had discovered the anæsthetic properties of chloroform, he having obtained it through Duncan & Flockhart,

chemists, of Edinburgh. The only acknowledgement ever given by Dr. Simpson for the essential information given by Waldie, was in these words, in a foot note in his original pamphlet: "Mr. Waldie first named to me the perchloride of formyle, as worthy, among others, of a trial." Mr. Waldie, feeling disappointed that Dr. Simpson should say so little about his agency in the matter, wrote a paper entitled, "Chloroform, the new agent for producing insensibility to pain by inhalation," which he read before the Liverpool Library and Philosophical Society, in which he gives a full account of the transaction, preceded by a history of chloric ether and chloroform. Mr. Abraham, of Liverpool, gives great weight to the claims of Mr. Waldie, who introduced the custom of making chloric ether from pure chloroform, instead of the direct method of Guthrie, and thinks that but for his suggestion some other person might have made the discovery, if, indeed, it would have been made at all.

RESIGNATION OF A FAITHFUL OFFICER.—But few who have had to do with the Pennsylvania Hospital during the past forty years will fail to remember with satisfaction their intercourse with the gentleman who, during that long period, has held the position of Apothecary in the Institution. The pharmacy of that hospital is conducted in a well-appointed shop, which, during the incumbency of Dr. Conrad, has been refitted with many improvements for dispensing. The corps of physicians who give their services to the hospital have always been among the first men of the medical profession in Philadelphia, whose prescriptions involve a great variety of dispensing, and especially include the newer remedies. Hence, it has often happened that the experience of Dr. Conrad has been useful to others beyond the Institution, and has been freely accorded. The corps of resident physicians, changing as it does annually or biennially, has brought Dr. Conrad into intimate intercourse with many members of the medical profession, and with numerous medical visitors to library and wards, and it is with much pleasure we record a recent action of those of his medical friends who, in one way or another have been associated with him during his long career. Knowing his intention to resign, these gentlemen quietly, without going beyond their own number, made up a purse of seventeen hundred dollars, and handed it to Dr. Conrad, with the assurance that it was his without any conditions. The sum itself is a handsome testimonial, but the presentation with it of a beautifully engrossed tribute of friendship, signed by the numerous friends who originated it, was as truly grateful to the recipient as it was highly honorable to the hearts and the liberality of the donors. After so long and meritorious a service we trust Dr. Conrad will live many years to enjoy the retirement which he has sought.

The Medical Times, a semi-monthly Journal of Medical and Surgical Science. Published on the 1st and 15th of each month, by J. B. Lippincott & Co., 715 Market street, Philadelphia. Saturday, Oct. 1, 1870. Vol. 1, No. 1.

This new medical journal enters the field with a fair promise of success, being supported by a long array of proposed contributors and an enterprising publisher. Its origination appears to have been the result of the deliberate consideration and approval of more than one hundred physicians, gathered in a meeting. "The Medical Times, therefore, appears as the result of no mere private enterprise, nor as the organ of any school or party, but as a journal which may fairly claim to represent the medical profession and medical interests of Philadelphia." "The position to which it aspires is one free alike from pure local interests and from partizan spirit. The only aims which shall be recognized in its management are the advancement of medical and surgical science, the detection and reform of abuses and the promotion of the interests of the profession at large." With these aims the Editor asks for it a welcome from the entire medical profession of the country.

A Cyclopædia of Quantitative Chemical Analysis. By Frank H. Storer, A.M., Prof. of General and Analytical Chemistry in the Massachusetts Institute of Technology. Part I. Sever, Francis & Co., Boston and Cambridge, 1870.

It is something new to present the details of quantitative analysis in the form of a dictionary. Prof. Storer has conceived the idea that the processes of analysis may be so arranged that the views of the best observers on each subject may be brought together when their importance justifies the space required, and where the several methods that have been suggested may be placed side by side. The author says he has drawn freely from the best works on analysis, and from other works when necessary, and further says, "It is noteworthy that the tendency of all the works recently published on quantitative analysis is towards condensation and abbreviation, while the aim of the present book is to show that perspicuity can be best gained by amplification if need be and *methodical arrangement*. The author believes that the interests of chemists and chemical students alike demand two kinds of books upon quantitative analysis. The one kind looking to completeness in all directions, while the other is given over either to special instruction or to the discussion of special applications of analysis in some one of the various departments of chemistry." The present part contains articles on acidimetry, alcoholometry, alkalimetry, but is chiefly occupied with carbon and carbonic acid, ending with carbonate of silver.

Temperatures are given by centigrade. To avoid increasing the volume wood-cuts are omitted. This is certainly a mistake, as, besides increasing the clearness of descriptions of processes, outline figures, showing the relation of parts and their shape in apparatus, give ideas more correctly than simple descriptions, and render these much briefer. Judging the coming volume by this first part, it will prove very useful to the chemist as well as to the student; to the former, by grouping processes of which he needs a reminder; to the latter, as affording advice and assistance in every variety of analysis, and in a form easily reached.

The People's Literary Companion, E. C. Allen & Co., Augusta, Maine, published monthly. 16 pp. folio. With an engraving called "From Shore to Shore," accompanying—by post—from the publishers; price 75 cents per year. We cannot do more than acknowledge the receipt of this package, and return thanks for the courtesy; we have neither time nor space to notice the paper as a literary production, it being entirely outside of our province.

Archives of Science and Transactions of the Orleans County Society of Natural Sciences, Oct. 1870, vol. 1, No. 1. J. M. Currier, M.D., of Newport, Vermont, and Geo. A. Hinman, M.D., West Charleston, Vt., p. 64, octavo.

This new advocate of science contains papers on the character and customs of the Pawnee Indians; a qualitative analysis of mineral springs in Essex county, Vermont; the Indian history of northern Vermont; a meteorological register, and other papers of interest. It is published quarterly at \$2.50 per annum.

Handbook of Medical Microscopy. By Joseph G. Richardson, M.D., microscopist to the Pennsylvania Hospital, etc., etc. Philadelphia, J. B. Lippincott & Co., 1871, pp. 333, 12mo.

The author of this volume has distinguished himself on several occasions by microscopical investigations, and has exhibited an amount of energy and perseverance that entitles his labors to respectful consideration. "The book owes its origin to a belief entertained by the author that there exists in the profession an increasing sense of the importance of microscopic research, and a growing desire to render its advantages available in the routine of daily practice." To meet this desire the book first describes the microscope and microscopic manipulation, and then enters on the microscopic examination of urine, healthy and morbid, pus, mucus, saliva, milk, blood, sputum in phthisis, vomited matters, anal, vaginal and uterine discharges, animal and vegetable parasites, blood stains and spermatic fluid in medico-legal cases, and finally hints on the examination of morbid growths. It is evident that the book addresses itself mainly to the physician in practice. The subjects are handled in a way that convinces the reader that the author is practically familiar with them. Wood cut illustrations are employed, and the work as a whole will be a valuable addition to the library of every earnest practitioner not already an expert.

The Medical Herbarium. A collection of dried samples of medicinal plants. By T. F. Allea, M.D., New York; part first.

Each part contains ten specimens of dried plants carefully mounted on thick white paper $11\frac{1}{2} \times 16\frac{1}{2}$ inches, with a fly leaf. The plants are poisoned with corrosive sublimate. "The Medical Herbarium" is intended for physicians and pharmacutists, and especially for lecturers. Price two dollars for each number. The idea is a good one. Each specimen has a printed slip giving the scientific and common name and

time of flowering, part used, etc. Henry M. Smith & Co., 107 Fourth avenue, New York, is the publisher, to whom orders should be sent.

The Physicians visiting list for 1871, twentieth year of its publication. Philadelphia. Lindsay & Blakiston.

One of the very first of its kind. This little annual helper to the physician again presents itself for notice, and deserves the large patronage it receives. It is well bound, in pocket-book form and contains a good pencil.

OBITUARY.

BENJAMIN BROGDEN ORRIDGE, one of the founders of the Pharmaceutical Society of Great Britain, died at London, on the 17th of July, 1870, aged 57 years. He was born at Malta, where his father held an official position, but returned to England during his minority. His efforts in the "Society" were varied, but chiefly directed to the library and the benevolent fund, the latter being his especial interest. Mr. Orridge's literary labors were chiefly of an archæological character.

PROF. WILLIAM ALLEN MILLER, of King's College, London, died at Liverpool, of apoplexy, on the 30th of September, 1870, having left London on the 13th to attend the British Association, and taken ill *en route*. He was born Dec. 17th, 1817, at Ipswich, was two years at Friends' school at Ackworth, in Yorkshire, where he imbibed a taste for chemical pursuits. He afterwards studied medicine at King's College, studied chemistry in Liebig's laboratory, became the assistant of Prof. Daniell and afterwards his successor, as the chemical teacher in King's College, where, for twenty-five years, he taught with great success. As a man, Prof. Miller occupied a high standing. One who knew him says, "No man since Faraday will be so much regretted." "It was impossible to come into contact with him without feeling oneself in the presence of a man of pure nature, of spotless integrity, of sound and sagacious judgement and of true gentlemanly feeling." Prof. Miller is chiefly known by his treatise on chemistry, published in 1855. His writings on various subjects are in the Journals. He was a member of the Royal Society and of many others, and was an honorary member of the Pharmaceutical Society, in which he took an interest.

AUGUSTUS MATTHIESSEN, F.R.S., Prof. of Chemistry at St. Bartholomew's Hospital, died on the 6th of October, from the effects of prussic acid, taken during temporary mental depression. He was born in London, Jan. 2d, 1831, and was one of the most promising of the younger chemists of England. He was a pupil of Bunsen, and whilst in his laboratory wrote his essay "on the preparation of the metals of the alkalies and alkaline earths by electrolysis." He also investigated the conductivity of metals, the constitution of narcotina, and, more recently, in conjunction with Mr. Wright, discovered apomorphia. He was a fellow of the Royal Society, and one of the Editors of the *Philosophical Magazine*.

WILLIAM MCCONNELL, a prominent member of the Canadian Pharmaceutical Society, died on the 28th of September, from the effects of a railroad accident. He lingered for ten hours, and died, having retained his faculties until death. He resided at Coburg, and leaves a widow and four children.—*Canad. Pharm. Journ.*

DR. BOLLEY, of Zurich, Switzerland, and Professor of Chemistry at the celebrated Polytechnic Institution in that city, died suddenly on the 3d of August last, in his 58th year. He was a native of Heidelberg.

CONSTITUTION,
BY-LAWS AND CODE OF ETHICS
OF THE
PHILADELPHIA COLLEGE OF PHARMACY,
WITH LISTS OF
OFFICERS, COMMITTEES,
MEMBERS AND GRADUATES,
AND THE
Announcement of the School of Pharmacy.

PHILADELPHIA:
MERRIHEW & SON, PRINTERS,
243 Arch Street.
1869.

Officers of the College.

PRESIDENT,
DILLWYN PARRISH.

VICE PRESIDENTS,
WILLIAM PROCTER, JR., ROBERT SHOEMAKER.

RECORDING SECRETARY,
CHARLES BULLOCK.

CORRESPONDING SECRETARY,
ALFRED B. TAYLOR.

TREASURER,
AMBROSE SMITH.

BOARD OF TRUSTEES,
THE OFFICERS OF THE COLLEGE, EX-OFFICIO, AND

ROBERT BRIDGES, M.D., <i>Ch'n</i> ,	DANIEL S. JONES,
ALFRED B. TAYLOR, <i>Sec'y</i> ,	EDWARD PARRISH,
THOMAS S. WIEGAND,	WILLIAM C. BAKES,
JAMES T. SHINN,	T. MORRIS PEROT,
CHARLES L. EBERLE,	JOHN M. MAISCH,
WILLIAM J. JENKS,	SAMUEL S. BUNTING,
WILSON H. PILE, M.D.,	EVAN T. ELLIS,
HENRY N. RITTENHOUSE,	CHARLES SHIVERS.

Committees of the College.

COMMITTEE ON SINKING FUND,

THOMAS S. WIEGAND,
T. MORRIS PEROT,
JAMES T. SHINN.

PUBLICATION COMMITTEE,

CHARLES ELLIS,
EDWARD PARRISH,
ALFRED B. TAYLOR,
JOHN M. MAISCH,
WILLIAM PROCTER, JR.

COMMITTEE ON DECEASED MEMBERS,

EDWARD PARRISH,
WILLIAM PROCTER, JR.,
CHARLES BULLOCK.

CHARTER.

AN ACT TO INCORPORATE THE PHILADELPHIA COLLEGE OF PHARMACY.

WHEREAS, to dispense and prepare drugs and medicines for the use of the sick requires knowledge and skill of a peculiar kind, an ignorance of which opens the door to numerous abuses and evils, and is pregnant with serious consequences to health and life; and it being the duty of every good government to protect, as far as in it lies, its citizens from those ills and dangers to which they become exposed in the multiplied relations of society, by promoting and encouraging wholesome institutions and regulations, calculated to advance the well-being, security and interests of the community; and it being represented to the Legislature that an institution has been established in the city of Philadelphia called "The Philadelphia College of Apothecaries," for the purpose of cultivating, improving, and making known a knowledge of Pharmacy, its collateral branches of science, and the best modes of preparing medicines and their compounds, and of giving instruction in the same by public lectures:

Now, that the purpose thereof may be the better carried into effect:

SECT. 1. Be it enacted, by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in general assembly met, and it is hereby enacted by authority of the same, That all such persons as now are members of the Philadelphia College of Apothecaries, or may hereafter become members of the same, be, and they are hereby made and constituted a corporation and body politic, in law and in fact, to have continuance forever, by the name, style and title of the PHILADELPHIA COL-

LEGE OF PHARMACY, with power to make one public and common seal, and also one private seal to use in their affairs, and the same or either of them to change at pleasure; to make contracts relative to said institution, to sue and be sued, and by that name and style to be capable, in law, of purchasing, taking, holding, and conveying any estate, real or personal, for the use of said corporation: Provided, that the annual income of such estate shall not exceed in value five thousand dollars, nor be applied to any other purposes than those for which this corporation is formed.

SECT. 2. And be it further enacted, by the authority aforesaid, That the said College may establish By-Laws and Rules for its government and regulation, and for the preservation and application of the funds thereof, not repugnant to the Constitution and Laws of the United States or of this Commonwealth, and shall have power to erect an edifice for their accommodation, and to constitute a faculty or learned body, to consist of such head or heads, and such a number of professors in pharmacy, materia medica, chemistry, and the collateral sciences as they may judge necessary and proper, and to do everything needful and necessary to the establishment of said College and Faculty.

SECT. 3. And be it further enacted, by the authority aforesaid, That the officers of said College be a President and two Vice Presidents, a Secretary and Treasurer, whose respective duties may be assigned by the By-Laws, and who shall be elected at the stated meeting of the College, held in the month of March in each year, and any vacancy that may occur may be supplied by a special election; there shall also be elected a Board of Trustees, consisting of sixteen members, and the officers of the College shall also be ex-officio members of the Board of Trustees; one half of the said Trustees shall be chosen at the stated meeting in March, and the other half at the stated meeting in September; and the said Board of Trustees, nine of whom shall constitute a quorum, shall conduct the ordinary affairs of the College, make such rules and regulations, and do all other things necessary for the government and support of the School of Phar-

macy, as they may deem fit and proper, and perform such duties as are or may be from time to time committed to them by the said College; the acts of the Board of Trustees, however, to be subject to the revision of the College at each stated meeting.

SECT. 4. And be it further enacted, by the authority aforesaid, That if the annual and semi-annual elections for officers of said College, and members of the Board of Trustees, shall not be held on the stated days, the said corporation shall not be thereby dissolved, but the officers and trustees shall continue in office until a new election.

JOSEPH LAWRENCE,

Speaker of the House of Representatives.

WILLIAM MARKS, JUN.,

Speaker of the Senate.

Approved March 30, 1822,

JOSEPH HEISTER.

CONSTITUTION.

ARTICLE I.

This Association shall be called "The Philadelphia College of Pharmacy." Its objects shall be the cultivation, improvement, and dissemination of a knowledge of Pharmacy and its collateral branches of science, and of giving instruction in the same by public lectures.

ARTICLE II.

The College shall consist of active, honorary and corresponding members.

ARTICLE III.

The officers of the College shall be a President, two Vice-Presidents, a Recording Secretary, a Corresponding Secretary, a Treasurer, a Librarian, a Curator and an Editor ; all of whom shall be elected annually, at the stated meeting in March.

ARTICLE IV.

The ordinary affairs of the College shall be conducted by a Board of Trustees, consisting of sixteen members, one-half of whom shall be chosen at the stated meeting in March, and the other half at the stated meeting in September. The said Board of Trustees, of which the officers of the College shall be ex-officio members, and of which nine shall constitute a quorum, shall make rules and regulations, and do all other things necessary for the government and support of the School of Pharmacy as it may deem fit and proper, and perform such duties as are

or may be from time to time committed to it by the said College: the acts of the Board of Trustees shall, however, be subject to the revision of the College at each stated meeting.

ARTICLE V.

The right of voting, of holding offices, and of transacting business, lies solely with the active members.

ARTICLE VI.

The College shall have a common seal.

ARTICLE VII.

The College may establish such by-laws for its government and regulation as may be deemed necessary and proper.

BY-LAWS.

CHAPTER I.

OF THE PRESIDENT AND VICE-PRESIDENTS.

ARTICLE I.—The President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall occupy the chair at the meetings of the College, enforce the laws, preserve order, and shall give the casting vote when necessary.

ARTICLE II.—He shall, at the request of any three members in writing, specifying the object in view, call a special meeting of the College.

ARTICLE III.—He shall nominate all committees, unless a ballot be required by the members, or they be otherwise provided for by the By-Laws; and he shall sign all the diplomas and certificates of the College.

ARTICLE IV.—He shall confer the degree on the Graduates of the College at the Annual Commencement.

CHAPTER II.

OF THE RECORDING SECRETARY.

ARTICLE I.—The Recording Secretary shall take and preserve correct minutes of the proceedings of the College, preserve all documents belonging thereto that may come into his possession, notify members of their election by the College, and inform the Treasurer of persons so elected.

ARTICLE II.—He shall keep a correct list of the members of the College, with the dates of their election, resignation or death.

ARTICLE III.—He shall issue the notices for the meetings of the College at least one day previous to the time, and furnish

the chairmen of all committees with a copy of the minute of their appointment.

ARTICLE IV.—He shall compile the minutes for publication in the Journal, and by his signature shall attest the certificates of membership and diplomas.

CHAPTER III.

OF THE CORRESPONDING SECRETARY.

ARTICLE I.—The Corresponding Secretary shall conduct and preserve the correspondence of the College with corresponding and honorary members, and scientific individuals and societies. It shall be his duty to reply to all foreign communications addressed to or regarding the College. He shall first submit all his proceedings to the President for his approval, and their record shall be read at each stated meeting of the College.

CHAPTER IV.

OF THE TREASURER.

ARTICLE I.—The Treasurer shall receive and take charge of the funds of the College, giving bond and security to the President, if required, for the faithful performance of this trust. He shall also hold and issue the certificates of membership and diplomas; shall have the custody of the seal, and affix the same under direction of the College or Board of Trustees.

ARTICLE II.—He shall collect all dues to the College, and shall pay no moneys unless on an order of the President or the Chairman of the Board of Trustees, countersigned by the respective Secretaries of College or Board, as the case may be.

ARTICLE III.—He shall notify the Secretary of the College, in writing, when any new member has signed the constitution and paid his initiation fee, and also when, from any cause, a member has ceased connection with the College.

ARTICLE IV.—He shall present annually to the Board of Trustees, at the stated meeting in February, a statement of his accounts.

CHAPTER V.

OF THE LIBRARIAN.

ARTICLE I.—The Librarian shall take charge of all books and pamphlets belonging to the College, and shall report on the condition of the same annually, at the stated meeting in March.

ARTICLE II.—He shall make out two copies of a catalogue of all books and pamphlets belonging to the College, adding thereto the title in full of each one as received. When books are presented to the College, the name of the donor shall be inserted in the catalogues, together with the date of the gift.

ARTICLE III.—One of the catalogues so made out shall be open to the inspection of members, and the other shall be placed in the archives of the College.

CHAPTER VI.

OF THE CURATOR.

ARTICLE I.—The Curator shall take charge of the Cabinet, together with all specimens that may, by donation or otherwise, come into the possession of the College, and shall report on the condition of the cabinet annually, at the stated meeting in March.

ARTICLE II.—He shall make out two copies of a catalogue of all specimens belonging to the College, adding thereto a description of each specimen as received. When specimens are presented to the College the name of the donor shall be inserted in the catalogues, together with the date of the gift.

ARTICLE III.—One copy of the catalogues so made out shall be open to the inspection of members, and the other shall be placed in the archives of the College.

ARTICLE IV.—All specimens in the Cabinet must be properly labelled by the Curator, as far as practicable.

CHAPTER VII.

OF THE JOURNAL.

ARTICLE I.—A Journal of such transactions of the College as may be ordered for publication, of original essays and of selections from scientific periodicals and books, shall be published

bi-monthly, and shall be entitled "The American Journal of Pharmacy."

ARTICLE II.—A standing committee of five members shall be elected annually, at the stated meeting in March, of whom the Editor shall be one, which shall be called the Publication Committee.

ARTICLE III.—Original papers read at the pharmaceutical meetings, theses and other original communications in any way recognized by the College, shall be referred to the Publication Committee, which shall examine and publish them at its discretion.

ARTICLE IV.—The Publication Committee shall fix the salary of the Editor, and the subscription price of the Journal, subject to the approval of the College; it shall collect the subscription money for the Journal, seeing that the distribution of the Journal is regularly attended to, and a correct record kept of the subscribers. The committee shall keep a correct account of its receipts and expenditures, of the profits of publication, and of the stock on hand, and shall make an annual report thereof at the stated meeting in March.

ARTICLE V.—The College is not responsible for the opinions and investigations contained in the communications published in the Journal.

CHAPTER VIII.

OF MEMBERS.

ARTICLE I.—Any candidate for membership must be proposed in writing by two members at one stated meeting of the College or of the Board of Trustees, and may be balloted for at the next stated meeting respectively of the College or of the Board of Trustees, as the case may be, when three negative votes shall defeat his election.

ARTICLE II.—All applications for membership shall be referred to a committee of three, whose duty it will be to investigate the moral character and professional standing of said applicants, and report at the next stated meeting.

ARTICLE III.—Members may reside in any part of the United States, and upon election shall pay an initiation fee of five dollars, and thereafter a contribution of five dollars annually, in advance.

ARTICLE IV.—Any active member who shall pay into the hands of the Treasurer the sum of fifty dollars at one time, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V.—Any member of the College elected under previous By-Laws of this College as an associate member, shall be entitled to change his membership, if he so wishes, to life-membership, on the payment of twenty-five dollars, and upon the return of his certificate of associate membership shall be entitled to receive a certificate of life-membership.

ARTICLE VI.—Any graduate in pharmacy, conforming in his professional conduct to the Code of Ethics adopted by this College, may be elected an active member.

ARTICLE VII.—Any druggist, manufacturing chemist, manufacturing pharmacist, or apothecary, conforming to the Code of Ethics adopted by this College, who is not a graduate in Pharmacy, may be examined by a Committee of Examination to be appointed annually by the Board of Trustees, and if his examination is satisfactory, he may, upon its recommendation, be elected an active member.

ARTICLE VIII.—Any such applicant, who has been established in business for at least six years, shall be eligible for membership.

ARTICLE IX.—Active members shall be entitled to receive the Journal free of charge, unless in arrears, in which case the Treasurer shall notify the Publication Committee to discontinue it until said arrearages are paid.

ARTICLE X.—Members of the College shall at all times have free access to the Library, subject to such rules and regulations as the Library Committee may adopt.

ARTICLE XI.—Pharmaceutists, druggists and chemists residing beyond the limits of the United States, who have attained a

good reputation for integrity, knowledge and ability in their business, may be elected corresponding members of the College.

ARTICLE XII.—No person residing in the United States shall be chosen a corresponding member, nor shall any corresponding member continue such after he shall have removed to reside permanently in the United States, but may become an active member upon the payment of the annual dues.

ARTICLE XIII.—All such persons, as from their knowledge of *Materia Medica*, Chemistry, Pharmacy, and their collateral branches of science, shall, in the opinion of the College, merit that distinction, may be elected Honorary Members of the College.

ARTICLE XIV.—Corresponding and honorary members shall have the same privileges as active members in regard to the use of the Library and Cabinet, and attending the lectures and meetings of the College, but they shall be exempt from any pecuniary obligation to the College, and shall have no right to vote or hold any office therein.

ARTICLE XV.—Any person elected an active member of the College, neglecting to pay his initiation fee and to sign the Constitution for six months after being informed of his election, shall forfeit his right of membership.

ARTICLE XVI.—No resignation shall be received from any active member of the College unless it be accompanied by a voucher from the Treasurer that his certificate of membership has been returned or destroyed, and all arrearages have been paid. The College may, however, by vote, continue the certificate to one who may have resigned his membership.

ARTICLE XVII.—A member may be expelled from the College for sufficient cause, by a vote of three-fourths of the active members present at a stated or special meeting, notice of the intention of the College to consider the subject of expulsion of a member having been given at a previous meeting, but no member shall be expelled without being notified and having an opportunity of being heard in his own defence.

ARTICLE XVIII.—Any member of the College neglecting the

payment of his contributions for three years after they are due, shall forfeit his right of membership, and is liable to have his name stricken from the list.

ARTICLE XIX.—Every member of the College shall, on paying two dollars, be entitled to a certificate of membership, signed by the President and Vice-Presidents, attested by the Recording Secretary and sealed with the seal of the College; such member covenanting in writing to return said certificate to the College on ceasing to be a member, from any cause whatever. The publication of the certificate of membership as a business advertisement is deemed inconsistent with the spirit of the Code of Ethics.

ARTICLE XX.—A committee of three shall be appointed at the stated meeting in September, whose duty it shall be to report annually the deaths of members of the College, with such biographical notices as may be appropriate.

CHAPTER IX.

OF THE TRUSTEES.

ARTICLE I.—The Board of Trustees shall meet once a month, or oftener, if necessary, by adjournments, or on the call of their chairman; and nine members shall constitute a quorum for the transaction of business.

ARTICLE II.—They shall control and regulate the School of Pharmacy; shall appoint Professors as vacancies may occur, or as they may deem expedient, to lecture on *Materia Medica*, Chemistry, Theory and Practice of Pharmacy and other branches of science.

ARTICLE III.—They shall be entrusted with the election of members as specified in Chapter VIII of these By-Laws.

ARTICLE IV.—They shall appoint a Committee of Examination, who, in conjunction with the Professors in the School of Pharmacy, shall examine and determine the fitness of candidates for the degree, and may, by vote, confer the degree of Graduate in Pharmacy upon such as are recommended as suitable by said Committee.

ARTICLE V.—They shall appoint committees to have the

oversight of the Library, the Cabinet, the Herbarium and the Apparatus of the College; and may from time to time appropriate funds of the College to the increase of these, for the benefit of the members and students.

ARTICLE VI.—They shall have the care and oversight of the College; keeping the hall in repair, with authority to rent such parts as may not be in use for the purposes of the College.

ARTICLE VII.—The minutes of the Board of Trustees shall be read at the meetings of the College for approval or dissent.

CHAPTER X.

OF MEETINGS.

ARTICLE I.—The stated meetings of the College for the transaction of business shall be held quarterly, on the last Mondays in March, June, September and December.

ARTICLE II.—Eleven members shall constitute a quorum.

ARTICLE III.—As soon as eleven members shall appear, at or after the appointed time of meeting, the President, or in his absence, one of the Vice-Presidents, or in their absence, a President *pro tempore*, shall take the chair and call the members to order.

ARTICLE IV.—After the meeting has been organized no member shall leave the room without permission from the presiding officer.

ARTICLE V.—The order of business at stated meetings shall be :

1. Members present noted by the Secretary.
2. Minutes of the last meeting read, corrected, if necessary, and adopted.
3. Minutes of the Board of Trustees since the last stated meeting of the College, read.
4. Unfinished business from minutes of last meeting.
5. Business presented by the minutes of the Board of Trustees.
6. Reports of Committees.
7. New Business.
8. Election of Members.
9. Adjournment.

ARTICLE VI.—As an adjourned meeting is the continuation of a previous meeting, after reading the minutes of such meeting, business may be taken up at that point where it was interrupted by the adjournment, and the ordinary order of business followed.

ARTICLE VII.—At a special meeting the College shall immediately proceed to the consideration of the business for which it was convened, and no other business shall be brought before it at such meeting.

ARTICLE VIII.—The Chair shall decide upon questions of order; from which decisions, however, an appeal to the meeting may be had, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE IX.—No motion shall be received unless seconded, nor until the mover, if required by the President or a member, shall have committed it to writing.

ARTICLE X.—Every member, when speaking, shall address the Chair; and when a question is before the meeting, no motion shall be received unless to amend, divide, commit, postpone, or to adjourn; and a motion to adjourn shall always be decided without debate.

ARTICLE XI.—On the call of any two members the yeas and nays shall be ordered; when the question is decided by yeas and nays, each member present shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered upon the minutes.

CHAPTER XI.

OF THE PHARMACEUTICAL MEETINGS.

ARTICLE I.—The Pharmaceutical meetings of the College, which shall be exclusively for scientific purposes, shall be held on the third Tuesday in every month, from October to May, both inclusive, or at such times as said meetings may determine.

ARTICLE II.—Five members shall constitute a quorum.

ARTICLE III.—As soon after the hour appointed as five members shall appear, the President, or, in his absence, one of the

Vice-Presidents, or, in his absence, a Chairman *pro tempore*, shall take the chair, and call the members to order.

ARTICLE IV.—A Registrar shall be elected annually, at the meeting in October, to issue the notices, prepare business, and record the proceedings of the Pharmaceutical meetings, and to make selections therefrom for publication in the Journal.

ARTICLE V.—The order of proceedings at these meetings shall be as follows :

1. Minutes of the preceding meeting read, corrected, if necessary, and adopted.
2. Strangers introduced.
3. Donations to library or cabinet received.
4. Reports of committees.
5. Written communications.
6. Verbal communications, miscellaneous business and conversation.

ARTICLE VI.—Members may introduce to these meetings graduates and students of the College, and other persons having an interest in science generally, who, when introduced, shall be entitled to participate in the scientific discussions.

CHAPTER XII.

OF CERTIFICATES.

ARTICLE I.—The College shall grant certificates as follows :

1. *To Active or Corresponding Members.*

The Philadelphia College of Pharmacy, instituted to promote and encourage a knowledge of Pharmacy and its collateral branches of science, and to guard against abuses in the preparation and sale of medicines, reposing confidence in the knowledge, skill and integrity of _____ has elected him an (active, corresponding, or life member, as the case may be). In testimony whereof are hereunto affixed the signatures of the proper officers, and the seal of the said College, this _____ day of _____ in the year of our Lord

2. *To Honorary Members.*

The Philadelphia College of Pharmacy has duly elected

an honorary member of the College, as a mark of respect for his scientific researches and acquirements. In testimony whereof are hereunto affixed the names of the officers, and the seal of the College, this _____ of the month of _____

CHAPTER XIII.

OF AMENDMENTS.

ARTICLE I.—Every proposition to alter or amend these By-Laws shall be submitted in writing at one stated meeting, and may be balloted for at the next stated meeting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of the By-Laws.

ARTICLE II.—No one or more of these By-Laws shall be suspended.

CHAPTER XIV.

MISCELLANEOUS.

ARTICLE I.—In all such points of order as are not noticed in these By-Laws the College is to be governed by the established usages in similar institutions.

CODE OF ETHICS.

The Pharmaceutical profession being one which demands knowledge, skill and integrity on the part of those engaged in it, and being associated with the medical profession in the responsible duties of preserving the public health, and dispensing the useful though often dangerous agents adapted to the cure of disease, its members should be united on some general principles to be observed in their several relations to each other, to the medical profession, and to the public.

The *Philadelphia College of Pharmacy* being a permanent, incorporated institution, embracing among its members a large number of respectable and well educated apothecaries, has erected a standard of scientific attainments, which there is a growing disposition on the part of candidates for the profession to reach; and being desirous that, in relation to professional conduct and probity, there should be a corresponding disposition to advance, its members have agreed upon the following principles for the government of their conduct:

1st. *The College of Physicians of Philadelphia* having declared that any connection with, or monied interest in, apothecaries' stores, on the part of physicians, should be discountenanced; *we in like manner consider* an apothecary being engaged in furthering the interests of any particular physician, to the prejudice of other reputable members of the medical profession, or allowing any physician a percentage or commission on his prescriptions, as unjust toward that profession and injurious to the public.

2d. As the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical edu-

cation does not qualify the graduate for these responsible offices, we should, where it is practicable, refer applicants for medical aid to a regular physician.

3d. As the practice of Pharmacy can become uniform only by an open and candid intercourse being kept up between apothecaries, which will lead them to discountenance the use of secret formulas, and promote the general use and knowledge of good practice, and as this College considers that any discovery which is useful in alleviating human suffering, or in restoring the diseased to health, should be made public for the good of humanity and the general advancement of the healing art,—no member of this College should originate or prepare a medicine, the composition of which is concealed from other members, or from regular physicians.

Whilst the College does not at present feel authorized to require its members to abandon the sale of secret or quack medicines, it earnestly recommends the propriety of discouraging their employment, when called upon for an opinion as to their merits.

4th. The apothecary should be remunerated by the public for his knowledge and skill, and in his charges should be regulated by the time consumed in preparation, as well as by the value of the article sold; although location and other circumstances necessarily affect the rate of charges at different establishments, no apothecary should intentionally undersell his neighbors with a view to their injury.

5th. As medical men occasionally commit errors in the phraseology of their prescriptions, which may or may not involve ill consequences to the patient if dispensed, and be injurious to the character of the practitioner, it is held to be the duty of the apothecary, in such cases, to have the corrections made, if possible, without the knowledge of the patient, so that the physician may be screened from censure. When the errors are of such a character as not to be apparent, without the knowledge of circumstances beyond the reach of the apothecary, we hold him to be blameless in case of ill consequences, the prescription being his guarantee, the original of which should always be retained by the apothecary.

6th. Apothecaries likewise are liable to commit errors in compounding prescriptions,—*first*, from the imperfect handwriting of the physician; *secondly*, owing to the various synonyms of drugs in use, and their imperfect abbreviation; *thirdly*, from the confusion which even in the best regulated establishments may sometimes occur, arising from press of business; and *fourthly*, from deficient knowledge or ability of one or more of the assistants in the shop, or of the proprietor.

We hold that in the first three instances named it is the duty of the physician to stand between the apothecary and the patient, as far as possible; and in the last that he should be governed by the circumstances of the case—drawing a distinction between an error made by a younger assistant incidentally engaged, and a case of culpable ignorance or carelessness in the superior.

7th. As the apothecary should be able to distinguish between good and bad drugs, in most cases, and as the substitution of a weak or inert drug for an active one may, negatively, be productive of serious consequences—we hold that the sale of impure drugs or medicines, from motives of competition, or desire of gain, when pure articles of the same kind may be obtained, is *highly culpable*, and that it is the duty of every honest apothecary or druggist to expose all such fraudulent acts as may come to his knowledge. But in reference to those drugs which cannot be obtained in a state of purity, we should, as occasion offers, keep physicians informed of their quality, that they may be governed accordingly.

8th. As there are many powerful substances that rank as poisons, which are constantly kept by apothecaries, and prescribed by physicians, and which are only safe in their hands, as arsenious acid, vegetable alkaloids, ergot, cantharides, etc.—we hold that the apothecary is not justified in vending these powerful agents indiscriminately to persons unqualified to administer them, and that a prescription should always be required, except in those cases when the poisons are intended for the destruction of animals or vermin—and in these instances only with the guarantee of a responsible person. And we hold that when there is good reason to believe that the purchaser is habitually using

opiates or stimulants to excess, every druggist or apothecary should discourage such practice.

9th. No apprentice to the business of apothecary should be taken for a less term than four years, unless he has already served a portion of that time in an establishment of good character. Apprentices should invariably be entered as matriculants in the School of Pharmacy, and commence attendance on its lectures at least two years before the expiration of their term of apprenticeship; and as the progress of our profession in the scale of scientific attainment must depend mainly upon those who are yet to enter it—it is recommended that those applicants who have had the advantage of a good preliminary education, including the Latin language, should be preferred.

BY-LAWS OF THE BOARD OF TRUSTEES.

CHAPTER I.

OF OFFICERS AND THEIR DUTIES.

ARTICLE I.—The officers of the Board shall be a Chairman and a Secretary, who shall be elected by ballot at the stated meetings of the Board next succeeding the semi-annual elections of the College.

ARTICLE II.—The Chairman shall preside at the meetings of the Board, enforce the laws, preserve order, put all motions to vote when seconded, and appoint the standing committees, excepting the Committee on Examinations. He shall sign all drafts on the Treasurer. He shall give the casting vote, where the Board is equally divided. At the request of three members, in writing, he shall call special meetings of the Board.

ARTICLE III.—In the absence of the Chairman, a chairman *pro tempore* shall occupy the chair, and perform the duties of the Chairman.

ARTICLE IV.—In the election of any committee (other than the standing committees of the Board), unless otherwise ordered, it shall be the duty of the Chairman of the Board to nominate the first member of such committee, who may then be elected by the Board; the member so elected shall nominate the second member of the committee, who may then be likewise elected, and he in turn shall nominate the third member of the committee, and so on until the requisite number has been elected.

ARTICLE V.—The Secretary shall keep regular minutes of the

proceedings of the Board, and a list or roll of its members ; preserve all documents belonging thereto ; certify all drafts of the Board upon the Treasurer ; notify the members of the time and place of meeting, at least one day previous, and furnish the chairmen of all committees with a copy of the minutes of their appointment, as well as individuals of their election to membership. He shall also inform the Treasurer of persons so elected.

CHAPTER II.

OF COMMITTEES AND THEIR DUTIES.

ARTICLE I.—The standing committees of the Board (excepting the Committee on Examinations) shall each consist of three members of the College, to be appointed at the first stated meeting of each Board, and shall be as follows :

- 1st. A Committee on the Hall.
- 2d. “ “ “ the Library.
- 3d. “ “ “ the Cabinet and Apparatus.
- 4th. “ “ “ the Herbarium.
- 5th. “ “ “ Accounts.
- 6th. “ “ “ Examinations.

ARTICLE II.—The Committee on the Hall shall have the general care of the hall, and shall provide such conveniences as may be necessary for the accommodation of the College, the Board of Trustees, and the School of Pharmacy.

ARTICLE III.—The Committee on the Library shall procure, with the funds placed at their disposal by the College and Board of Trustees, such works on Pharmacy, Chemistry, Materia Medica, and the collateral sciences, as they may deem proper to be placed in the library ; shall negotiate all exchanges of duplicates, and shall keep all books, pamphlets and manuscripts in good order, for the use of members and their apprentices, subject to such rules and regulations as the Committee, with the approbation of the Board, may adopt.

ARTICLE IV.—The Committee on the Cabinet and Apparatus shall procure, with the funds placed at their disposal by the College and Board of Trustees, such specimens and apparatus illustrating Pharmacy, Chemistry, Materia Medica, and the collate-

ral sciences, as they may deem proper, and shall arrange them in proper order, subject to such rules and regulations as the Committee, with the approbation of the Board, may adopt.

ARTICLE V.—The Committee on the Herbarium shall keep the herbarium in order; shall collect plants and place them in a condition to be used in Lectures on Botany, Materia Medica, Pharmacy, &c.; shall effect exchanges and enter into correspondence with individuals, societies and colleges of our own and foreign countries.

ARTICLE VI.—The Committee on Accounts shall examine and approve (by at least one of its members) all bills previous to their being presented to the Board for payment.

ARTICLE VII.—The Committee on Examinations shall consist of five members of the Board of Trustees, one of whom shall be a Professor in the College, and shall be elected by ballot, annually, at the stated meeting of the Board in December.

ARTICLE VIII.—The Committee on Examinations shall examine candidates for membership who are not graduates in Pharmacy, in reference to their fitness to conduct the business of druggist and apothecary, and shall report to the next stated meeting of the Board held after such examination.

ARTICLE IX.—Immediately after the conclusion of the lectures, and in June, the Committee on Examinations together with the Professors, shall receive and examine all original dissertations or theses presented to them by candidates for the diploma of the College, and shall carefully examine all candidates, personally, upon their qualifications to conduct the business of druggist and apothecary, in a reputable and scientific manner, and report their opinion jointly to the Board of Trustees at their next stated meeting after the examination, who shall decide finally upon all such applications for the diploma of the College.

ARTICLE X.—The Committee on Examinations shall deliver to the Board of Trustees, at the stated meeting at which they shall report, the theses and accompanying certificates of all candidates whom the Professors and Committee may jointly recommend as suitable to receive the diploma of the College, which

documents shall then be placed in charge of the Library Committee.

ARTICLE XI.—It shall be the duty of the standing Committees on the Hall, the Library, the Cabinet and Apparatus, and the Herbarium, to report to the Board, at their stated meetings in March and September, or oftener if necessary, whether any and what business has come before them relating to the duties respectively assigned them.

CHAPTER III.

OF MEETINGS.

ARTICLE I.—The stated meetings of the Board of Trustees shall be held on the first Tuesday in every month.

ARTICLE II.—Special meetings may be called by resolution of the Board, or at the request of three members in writing.

ARTICLE III.—At a special meeting, after the reading of the call for such meeting, the Board shall immediately proceed to the consideration of the business for which it was specially convened, and no other business shall be brought before it at such meeting.

ARTICLE IV.—At an adjourned meeting, after the reading of the minutes of the previous meeting, business shall be taken up at that point where it was interrupted by the adjournment, and the ordinary order of business followed.

ARTICLE V.—As soon as nine members shall appear at or after the time of meeting, the Chairman or, in his absence, a chairman *pro tempore*, shall take the chair and call the Board to order.

ARTICLE VI.—In the absence of the Secretary a secretary *pro tempore* shall be elected, who shall perform the duties of the Secretary until his arrival.

ARTICLE VII.—After the Board has been organized no member shall leave the room without permission from the Chairman.

ARTICLE VIII.—No motion shall be put until the mover, if required by the Chairman or a member, shall have committed it to writing.

ARTICLE IX.—At stated meetings business shall proceed in the following order :

1. Members present noted by the Secretary.
2. Minutes of the last meeting read, corrected if necessary, and adopted.
3. Unfinished and deferred business.
4. Reports of standing committees.
5. Reports of special committees.
6. Presentation of bills.
7. New business.
8. Proposition of members.
9. Election of members.
10. Adjournment.

ARTICLE X.—Every member when speaking shall address the Chairman ; and when a question is before the meeting no motion shall be received unless to amend, divide, commit, postpone or to adjourn ; and a motion to adjourn shall always be decided without debate.

CHAPTER IV.

OF ELECTION OF MEMBERS.

ARTICLE I.—Members may be elected by the Board of Trustees, as provided for in Chapter VIII of the By-Laws of the College, page 14.

ARTICLE II.—Election of members shall be by ballot.

ARTICLE III.—If the election of any proposed candidate for membership be defeated, the name of such candidate shall not be recorded on the minutes.

CHAPTER V.

OF GRADUATION.

ARTICLE I.—Every person upon whom a diploma of this College shall be conferred must be of good moral character, must have arrived at the age of twenty-one years, have attended two courses of each of the lectures delivered in the College, or one course in the College and one course in some other respectable College of Pharmacy, the last of which must be in this College ;

or, where there is no such college organized in his locality, in some respectable medical institution in which the same branches are taught.

ARTICLE II.—He shall have served an apprenticeship of at least four years with a person or persons qualified to conduct the drug or the apothecary business; at least three years and three months of which must have expired before the examination; of which circumstances he must produce sufficient evidence.

ARTICLE III.—He shall also be required to produce an original dissertation, or thesis, upon some subject of the *Materia Medica*, Pharmacy, Chemistry, or one of the branches of science immediately connected therewith, which shall be written with neatness and accuracy in his own handwriting.

ARTICLE IV.—The thesis, with the evidence of apprenticeship and diploma fee, shall be deposited with the senior Professor of the School, on or before the twentieth of February of the session in which the application shall be made.

ARTICLE V.—Students who are in the employ of members of the College shall pay for each matriculation ticket two dollars; all others shall pay four dollars.

ARTICLE VI.—Every student must obtain from the Secretary of the Board of Trustees a matriculation ticket for every session, but only the first matriculation ticket shall be charged for.

ARTICLE VII.—The fee payable to each Professor for each course of lectures shall be twelve dollars.

ARTICLE VIII.—The diploma fee shall be ten dollars.

ARTICLE IX.—Graduates and members of the College, and all students who have paid for two full courses of lectures in the College, shall be admitted to subsequent lectures gratuitously.

ARTICLE X.—The annual examination for degrees will be held early in the month of March; but a second examination will be held in the month of June, of which those students who may not have accomplished their term of service at the annual examination, and other qualified applicants, may avail themselves, notice of application for such examination having been given before the first day of June.

ARTICLE XI.—Any student who shall wilfully and persistently annoy or disturb the Professors and the class, or shall cause any damage to the property of the College, or to the apparatus or specimens exhibited by the Professors, shall be liable for all such damage, and also to expulsion from the class, with the forfeiture of his tickets.

CHAPTER VI.

ARTICLE I.—Every proposition to alter or amend these By-Laws shall be submitted in writing at one stated meeting, and may be balloted for at the next stated meeting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of the By-Laws.

ARTICLE II.—No one of these By-Laws shall be suspended.

COMMITTEES OF THE BOARD OF TRUSTEES.

Committee on the Hall,—William C. Bakes, Charles Bullock, Dillwyn Parrish.

Committee on the Library,—William Procter, Jr., William C. Bakes, Henry N. Rittenhouse.

Committee on the Cabinet and Apparatus,—William Procter, Jr., Edward Parrish, Ambrose Smith.

Committee on the Herbarium,—John M. Maisch, Thomas S. Wiegand, James T. Shinn.

Committee on Accounts,—Dr. Wilson H. Pile, William J. Jenks, Charles Shivers.

Committee on Examination,—Edward Parrish, William J. Jenks, Daniel S. Jones, William Procter, Jr., Charles Shivers.

ANNOUNCEMENT.

The Annual Courses of Instruction in the College commence on the first lecture day in October, at 7½ o'clock, P. M., and will be continued tri-weekly, on Monday, Wednesday and Friday of every week, at seven and eight o'clock, P. M., until the close of February.

The Course on Chemistry.

By Prof. Bridges.

In this Course will be presented a systematic view of the science, its improvements and condition up to the present time. Commencing with caloric, its laws and principal applications, this will be followed by affinity, the laws of chemical combination and chemical notation.

The consideration of the non-metallic elements will be in the order of their value and abundance; the compounds with any previously described being noticed in connection with each, unless of an organic nature. Commencing with oxygen, then follows hydrogen, nitrogen, sulphur, chlorine, iodine, bromine, phosphorus, carbon, boron, silicon, and their combinations with each other, nitrogen and hydrogen excepted.

The metals will be classified according to the nature of the more important compounds they form with oxygen. Basifiable forming alkalies, potassium, sodium, lithium, (and here the compounds of nitrogen and hydrogen, as forming the quasi-metal ammonium, will be noticed :) forming alkaline earths, barium, strontium, calcium, magnesium; forming earths, aluminium, &c.; forming ordinary bases, iron, manganese, chromium, &c., zinc, copper, lead, bismuth, &c. Acidifiable: bismuth, tin, arsenic, antimony, &c. Finally, an intermediate class, forming weak acids or bases, decomposable at a red heat: mercury,

silver, gold, platinum, &c. Under each metal will be introduced their compounds with non-metallic elements and their inorganic salts, with their pharmaceutic relations and preparations in the United States and British Pharmacopœias.

Organic chemistry will conclude the course. In this will be considered all those compounds of general or pharmaceutical interest, which are not included in the other branches of instruction, without any aim at special classification; comprising those which are either natural products or are the results of spontaneous change or decomposition by heat alone, or with alkalis and the action of non-metallic elements, acids, &c.

Commercial impurities (whether of design or accident) will receive due attention, and their character and means of detection will be pointed out.

In connection with all articles of an active character, their toxicological relations will be given, together with their antidotes and methods of detection.

Every article noticed will be exhibited both in the crude and perfect state, and processes for their production, formation and purification detailed, and, when practicable, shown.

In all cases illustrations by experiment will be introduced, in proof of the assertions or facts, and by diagrams, to convey the fundamental principles of the science, and thus more strongly impress the learner's mind.

Text book, Fowne's Chemistry.

The Course on Materia Medica.

By Prof. Maisch.

This course will open with a lecture on the proper time and best mode of collecting and preserving the various substances of vegetable and animal origin used in medicine. The drugs will then be considered in a systematic manner, so as to bring those together which resemble each other in their physical properties and structure.

The drugs of vegetable origin will be treated of in accordance with the different organs of plants of which they consist,

either wholly or in part. From the roots proper, the lectures will proceed to consider the underground stems, rhizomes, bulbs, corms and tubers, then the overground stems and woods, the barks, whether obtained from root or trunk, then the herbs and leaves, including those herbaceous drugs which are usually found in commerce, containing all the organs requisite for establishing, by botanical analysis, their true origin. These will be followed by the drugs consisting of flowers or parts of flowers, then by the fruits proper, and finally the seeds.

The products obtained from plants in various ways will next claim attention, and will be considered in groups, based on their physical appearance and chemical constitution, and embracing morbid excrescences and exudations, volatile oils, fixed oils, resins, oleo-resins, gum-resins, starches, &c.

The consideration of the drugs of animal origin will conclude the course.

This course will aim mainly to present to the student the means and leading characteristics for recognizing each individual drug, and distinguishing it from all others; the physical characters of the drugs, their structure and their chemical relations will, therefore, occupy most of the time allotted to the course, since by these means recognition can be effected and substitutions or adulterations discovered. The botanical and commercial history of the drugs will receive their full share of attention, as will also the important proximate principles upon which the medicinal virtues of the drugs depend or are supposed to depend; a concise view will also be given of the medical properties, the officinal preparations, and the doses of the same.

The drugs derived from the animal kingdom will be arranged and treated of upon the same principles and in a similar manner as those of vegetable origin.

The extensive cabinet and herbarium belonging to the College, as also the private collection of the Professor, in addition to well executed plates and drawings, will furnish ample means of illustration, and, wherever it is deemed necessary, experiments will be made in proof of the facts stated.

The Course on Botany.

By Prof. Maisch.

The principles upon which pharmacognosy—to the pharmacist one of the most important branches of materia medica—will be taught, renders a knowledge of botany, to say the least, very desirable. The importance of this science has been fully recognized by the College, by confiding to the Chair on Materia Medica the duty of delivering lectures on Botany during the spring and summer. Though as yet not considered obligatory, it is nevertheless of importance to the student to embrace the opportunity of obtaining a theoretical and practical knowledge of this science.

The course will consist, until further notice, of lectures on general and special morphology, organology, and a concise review of systematic botany, embracing the characteristics of those natural orders and genera which are of greatest importance to the pharmacist. For the present, one afternoon of each week commencing in April, will be devoted to these lectures, and to excursions into the country surrounding Philadelphia, affording to students, besides a healthful recreation, the best means of becoming practically acquainted with the living plants.

The Course on Theory and Practice of Pharmacy.

By Prof. Parrish.

This will commence with instructions in the art of weighing and measuring, and a succinct account of the systems of weights and measures authorized by the United States and British Pharmacopœias, and the French or decimal system. Connected with this, the subject of Specific Gravity will claim attention.

The manipulations of the shop and laboratory,—powdering, sifting, solution, filtration, maceration, percolation, the generation, application and management of heat, the water bath, sand

bath and steam bath, and the processes of evaporation and distillation, will be successively described and exhibited.

In this connection the officinal, and some unofficial preparations will be classified and described, and their proportions, properties and doses exhibited, with a view to familiarize the student with this class of facts, so essential to a ready familiarity with his profession.

Proximate principles of plants, such as starches, gums, sugars, and fixed and volatile oils, resins, and those animal products used in medicine, which will be brought into view in the lectures on *Materia Medica*, will be noticed in this course only in their more practical relations to the art of preparing and dispensing medicines.

Of the organic acids, alkaloids and neutral principles, those which are prepared by the chemist and pharmacist will come within the scope of this course; the processes of their manufacture will be described, and their uses, properties, applications and tests of purity explained.

The branch of the general subject called *Extemporaneous Pharmacy* will claim attention toward the end of the course. It will embrace the construction of formulas and prescriptions, and the proper technical language and abbreviations, and the art of combining medicines into eligible forms, and of preparing pills, lozenges, suppositories, mixtures, inhalations, fumigations, cerates, ointments, liniments, plasters, cataplasms, &c.

Dispensing medicines, which is an art of the highest interest and utility to the pharmacist, is an appropriate termination to this course. It embraces a consideration of a variety of apparatus, implements, glass ware, &c., and of those minor manipulations which, when skilfully executed, add so much to the success and reputation of the pharmacist.

The text book of this course is the *Treatise on Pharmacy*, by Prof. Parrish, third edition.

The public Commencement for conferring degrees is held near the middle of March.

The New Hall.

The large and annually increasing classes in the College have rendered it necessary to erect a more commodious building for the lectures, and for the proper arrangement and display of the library, apparatus and several cabinets of specimens.

The Hall is situated on a lot of about 70 by 85 feet, in the vicinity of Tenth and Cherry streets, the main entrance being at No. 145 N. Tenth street, where the Janitor resides, to facilitate the entrance of visitors when the front door is closed, and to give information to strangers.

In the second and third stories are two large lecture rooms, each 50 by 43 feet, with seats so arranged and elevated as to command an unobstructed view of the specimens, diagrams and other illustrations used in the lectures. Professors rooms, to contain their private cabinets and apparatus for illustration, and a society room, for the use of the advanced classes, adjoin these lecture rooms.

On the first floor are rooms for the library, the College cabinets, herbarium and microscope, and for the meetings of the College and Trustees, also for the laboratory for practical instruction in chemistry and pharmacy.

The ceilings throughout the building are high; it is lighted from all sides (the laboratory by sky-lights), and being situated back from the street all the rooms are remarkably quiet and well adapted to the purposes for which they are designed.

Practical School.

The Alumni of the College have recently subscribed a fund for the establishment of a practical laboratory, and a room has been appropriated to this in the new Hall. It is the intention of the College to open such a department, as part of the scheme of instruction, as soon as the necessary arrangements can be

perfected. The particulars cannot be announced for the session 1869-70, though the faculty design to render the room in some degree available to the students, even in advance of the complete organization of the laboratory.

Collateral Studies.

Many students coming to Philadelphia to spend a winter in attendance upon the College, are desirous of occupying a portion of the time in general self-culture and improvement, for which Philadelphia affords great facilities. The Museum of the Academy of Natural Sciences will be open to members of the Class on Tuesday and Friday afternoons—tickets obtained from either of the Professors—and, by special arrangement, students interested in natural history may obtain the other facilities of the Academy free of charge. Private instructions in ancient and modern languages and in mathematics may be readily obtained, and the various “Commercial Institutes” afford facilities for improvement in penmanship, book-keeping and other useful branches of knowledge.

Remunerative Employment.

A few of those resorting to the College from a distance can obtain employment on moderate salaries during attendance upon it, by writing to Mr. W. C. Bakes, No. 800 Arch Street, who keeps the register of applicants provided by the College. But a small proportion only of these can obtain suitable situations, and those who do not will be at an expense of from \$5 to \$8 a week for board.

Roll of Members of the College,

With the date of their Election.

* Deceased. † Resigned. ‡ Dropped from Roll.

ORIGINAL MEMBERS.	[Daniel B. Smith,	1821	John Y. Goodyear,	1843
	[*Warder Morris,	1821	Jacob L. Smith,	1843
	[George D. Wetherill,	1821	† William P. Troth,	1844
	[Peter Williamson,	1821	† John Harris, M. D.,	1845
	[*Frederick Klett,	1821	William Ellis,	1845
	[*Frederick Brown,	1821	John Reakirt,	1845
	[Charles Ellis,	1821	Robert C. Brodie,	1845
	[*Thomas Oliver,	1821	Samuel N. James,	1845
	[*Alex. Fullerton,	1821	Daniel S. Jones,	1845
	[*Algernon S. Roberts,	1821	William J. Jenks,	1846
	* Joseph Reakirt,	1821	† Alexander F. Hazard,	1846
	Samuel F. Troth,	1822	Daniel L. Miller, Jr.,	1846
	Edward Roberts,	1824	James N. Marks,	1846
	* Samuel C. Shepherd,	1825	Robert C. Davis,	1846
	* Samuel P. Shoemaker,	1826	† Benjamin R. Smith,	1847
	John Horn,	1826	† Francis Zerman,	1847
	William Biddle,	1826	Alfred B. Taylor,	1848
	William Hodgson, Jr.,	1828	Athanase Roidot,	1848
	George B. Wood, M. D.,	1829	Charles Bullock,	1849
	John C. Allen,	1830	* Thomas Gegan,	1849
	Dillwyn Parrish,	1831	* Frederick L. John,	1849
	* Franklin Bache, M. D.,	1831	† Charles S. Rand,	1851
	Joseph C. Turnpenny,	1834	Edmund A. Crenshaw,	1851
	Thomas H. Powers,	1834	* Robert P. Thomas, M. D.,	1851
	Thomas J. Husband,	1834	† Charles H. Dingee,	1851
	† John Bringham,	1834	† Joseph A. McMakin,	1852
	Samuel Simes,	1835	Caleb R. Keeney,	1852
	Joseph Carson, M. D.,	1836	Thomas S. Wiegand,	1852
	William Wetherill, M. D.,	1837	Evan T. Ellis,	1852
	Thomas P. James,	1838	† Alfred A. B. Durand,	1852
	† Henry W. Worthington,	1838	† Bradford Ritter,	1853
	Richard W. Test,	1839	† Henry M. Troth,	1853
	Robert Bridges, M. D.,	1839	† William Taylor,	1854
	John Gilbert,	1839	† John C. Savery,	1854
	Ambrose Smith,	1839	James L. Bispham,	1854
	† Claudius B. Linn,	1840	Benj. J. Crew,	1855
	William Procter, Jr.,	1840	Samuel S. Bunting,	1855
	Paul G. Oliver,	1841	† Samuel S. Garrigues,	1855
	† John H. Ecky,	1841	Henry N. Rittenhouse,	1855
	* Henry C. Blair,	1842	* Lewis M. Emanuel,	1855
	Robert Shoemaker,	1843	† Herman Leuchsenring,	1855
	Caleb H. Needles,	1843	Andrew W. Gayley,	1856
	Edward Parrish,	1843	† Thomas Weaver,	1856

William C. Bakes,	1856	† Lewis C. Diehl,	1864
† Richard Peltz,	1856	Richard N. Shoemaker,	1864
† T. Morris Perot,	1856	Frederick Brown, Jr.,	1864
† F. C. Hill,	1856	Edwin Tomlinson,	1864
† M. Henry Kollock,	1856	S. Mason McCollin,	1865
William Weightman,	1856	Charles P. Rubincam,	1865
Edward H. Hance,	1857	Alfred Mellor,	1865
Charles Shivers,	1857	Theodore A. Royal,	1866
Wilson H. Pile, M. D.,	1857	H. T. Peck,	1866
Jacob Dunton,	1857	Henry Cramer,	1866
William B. Webb,	1857	Edward C. Jones,	1866
Adam H. Wilson,	1858	Samuel T. Jones,	1866
* Theodore Dilks,	1858	Isaac W. Smith,	1867
† Thomas Lancaster,	1858	Alonzo Robbins,	1867
J. Bloomfield Wetherill,	1858	William J. Miller,	1867
† Matthew W. Selfridge,	1858	Charles L. Eberle,	1867
* W. H. Squire,	1858	† Edmund Pollitt,	1867
David L. Stackhouse,	1858	Henry A. Vogelbach,	1867
† John Field,	1858	Joseph P. Bolton,	1867
J. Lewis Crew,	1858	† Arthur H. Little,	1867
Alfred Tatem,	1858	H. C. Archibald,	1867
James T. Shinn,	1858	C. C. Moore,	1867
† Pierce B. Wilson,	1858	George Y. Shoemaker,	1868
J. Clarkson Griffith,	1858	H. B. Lippincott,	1868
William R. Warner,	1859	John Bley,	1868
William Evans, Jr.,	1859	Charles H. Eggert,	1868
George C. Evans,	1859	William H. Webb, M.D.,	1868
George J. Scattergood,	1859	George M. Snowden,	1868
Edward Donnelly, M. D.,	1859	Edward Gaillard,	1868
Emilius Herwig,	1859	William McPherson,	1868
Joseph Landschutz,	1859	George D. Blomer,	1868
Peter J. Hassard,	1859	Charles L. Jefferson,	1869
Gustavus Krause,	1859	W. H. Walling,	1869
Alfred W. Test,	1859	C. F. Gristock,	1869
J. A. Heintzelman,	1859	Clemmons Parrish,	1869
† E. Raphael Perrot,	1860	Louis G. Bauer,	1869
Robert England,	1860	Richard Walmsley,	1869
John M. Maisch,	1860	Israel J. Grahame,	1869
† John E. Clarke,	1860	Charles E. Haenchen,	1869
† Henry F. Geger,	1860	Andrew Blair,	1869
John E. Carter,	1860	William G. Buchanan,	1869
Roger Keys,	1860	Henry C. Eddy,	1869
Thomas A. Lancaster,	1860	Samuel Campbell,	1869
Theodore A. Keffer,	1861	James S. Robinson,	1869
Augustus F. W. Neynaber,	1861	Louis A. Bates,	1869
William B. Thompson,	1862	George W. Kennedy,	1869
† I. Henry Abbott,	1862	William McIntyre,	1869
George Ashmead,	1863	Henry K. Bowman,	1869
George W. Eldridge,	1864	M. G. Rosengarten,	1869
F. A. Keffer, M. D.,	1864	Louis Koch,	1869
† W. H. Githens,	1864		

ASSOCIATE MEMBERS.

John Rickey, Jr.,	Trenton, N. J.	Albert E. Ebert,	Chicago,
John F. Heinitsch,	Lancaster, Pa.	Flodoardo Howard,	Washington, D. C.
Elias Maynard,	Boston, Mass.	W. L. Atlee, M. D.,	Philadelphia, Pa.
Michael Wolf, M. D.,	Cincinnati, O.	* George W. Merchant,	Lockport, N. Y.
Edward La Roque,	Baltimore, Md.	Lansing B. Swan,	Rochester, N. Y.
Peter Madeira,	Pittsburgh, Pa.	Nathaniel W. Thatcher,	Chillicothe, O.
Marshall C. Slocum,	New York.	Thomas W. Harris,	Jacksonville, Tenn.
Samuel Elliott,	Carlisle, Pa.	Thomas G. McKenzie,	Baltimore, Md.
John Milhau,	New York.	Thomas Seabrook,	Princeton, N. J.
George W. Andrews,	Baltimore, Md.	James C. Wells,	Rochester, N. Y.
John F. Stahl,	Cincinnati, O.	Edward McPherson,	New Orleans.
Bernard Mesthe.		Edward Barry, M. D.,	Augusta, Ga.
Jas. Cook, M. D.,	Fredericksburg, Va.	William J. Allinson,	Burlington, N. J.
Charles Bonsall,	Cincinnati, O.	Llewellyn S. Haskell,	New York.
E. H. Heinitsh,	Columbia, S. C.	Edward S. Wayne,	Cincinnati, O.
James Smith,	Lancaster, Pa.	Edward McInall,	Wilmington, Del.
John W. Swaim,	New Orleans.	Joseph M. Turner,	Savannah, Ga.
* Franklin Scammon,	Hallowell, Me.	Peter V. Coppuck,	Mount Holly, N. J.
Jackson B. Wood,	Richmond, Va.	J. C. C. Hughes,	Pottsville, Pa.
W. Ralph Higgenbotham.		* Joseph Laidley,	Richmond, Va.

HONORARY MEMBERS.

* John Redman Coxe, M. D.,	Philada.	Prof. Dr. F. A. Fluckiger,	Bern.
T. G. Clemson,	"	Prof. T. Redwood,	London.
* Prof. Jno. K. Mitchell, M. D.,	"	* Jacob Bell,	"
* Prof. R. Dunglison, M. D.,	"	John T. Barry,	"
Prof. Sam'l Jackson, M. D.,	"	Robert Alsop,	"
Elias Durand,	"	L. Derosne,	Paris.
* Wm. Darlington, West Chester, Pa.		Prof. Pelletier,	"
* Prof. Benj. Silliman, N. Haven, Con.		C. Gerhart,	"
Jacob Bigelow, M. D.,	Boston, Mass.	V. Regnault,	"
Freeman Dana, M. D.,	"	* Prof. Michael T. Faraday,	London.
Robert Peter,	Lexington, Ky.	Prof. Justus von Liebig,	Munich, Bav.
Thos. J. Wray, M. D.,	Augusta, Ga.	Michael Donovan,	Dublin.
John Torrey, M. D.,	New York.	Prof. M. Berthelot,	France.
Prof. Thomas Nuttall,	Boston, Mass.	Prof. Louis Miahle,	"
Asa Gray,	Cambridge, Mass.	Prof. A. Bussy,	"
Charles Murray,	Beunos Ayres.	E. Pasteur,	"
Daniel Hanbury,	London.	Auguste Cahours,	"
Henry Deane,	Clapham,	Pierre François Guillaume	
Wm. Crookes, F. R. S.,	"	Boullay,	"
Jno. Eliot Howard, F. L. S.,	"	W. Dankwortt,	Magdeburg.
Prof. Dr. Fred. Mohr,	Coblentz.	Joseph Dittrich,	Prague.
Prof. Dr. Fred. Wöhler,	Gottingen.	Prof. Adolph Duflos,	Breslau.
Prof. Dr. A. W. Hofmann,	Berlin.	Dr. G. C. Wittstein,	Munich.
Prof. Dr. K. Von Schroff,	Vienna.	C. Frederking,	Riga.
Ivan Pfeffer,	St. Petersburg.	Prof. J. S. Stas,	Belgium.
Prof. Dr. De Vry,	Rotterdam.	Prof. De Lucca,	Naples.
Prof. Dr. X. Landerer,	Athens.	Carlos Ferrari,	Madrid.

* Deceased.

CORRESPONDING MEMBERS. .

John Attfield,	London.	Prof. Dr. J. B. Henkel,	Tubingen.
Henry B. Brady, New Castle on Tyne.		Dr. Rieckher,	Marbach.
John Abrams,	Liverpool.	Albert Frickhinger,	Nirdlingen.
T. B. Groves,	Weymouth.	A Margraff,	Berlin.
Charles Tichbourne,	Dublin.	Dr. Carl Schacht,	Berlin.
F. Crave Calvert,	Manchester.	Dr. Clamor Marquart,	Bonn.
John Mackay,	Edinburgh.	A. Scheurer von Waldheim,	Vienna.
W. W. Stoddart,	Bristol.	— Beckert,	Vienna.
J. C. Brough,		Dr. J. J. Bernouilly,	Basel.
Augustin Delondre,	Sevres.	A. Gruner,	Bern.
Prof. L. R. LeCanu,	Paris.	L. Lade,	Geneva.
Dr. J. Leon Soubeiran,	"	— Walter,	Amsterdam.
Stanislaus Martin,	"	D. A. Van Bastelaer,	Charleroi.
E. Robinet,	"	Prof. Norbert Gille,	Brussels.
François L. M. Dorvault,	"	Prof. Dr. G. Dragendorff,	Dorpat.
M. Gobley,	"	Dr. Arthur Casselmann,	St. Petersburg.
Prof. M. A. Chevallier,	"	Dr. Bjoerklund,	"
Prof. Planchon,	"	Louis Moska,	Turin.
Paul Antoine Cap,	"	Nicholas Sinimberghi,	Rome.
Prof. Dr. H. Ludwig,	Jena.	Dr. Gastinel,	Cairo.
Prof. Dr. L. A. Buchner,	Munich.	Dr. Theodore Peckolt,	Cantagallo.

Catalogue of the Graduates

OF THE

PHILADELPHIA COLLEGE OF PHARMACY,

WITH THE DATES OF THEIR GRADUATION.

Abbott, John Henry	1851	Blair, Andrew,	1865
Abernethey, J. M.	1861	Blair, Henry C.	1836
Alexander, Maurice W.	1854	Blair, Henry C.	1866
Allaire, Charles B.	1867	Blithe, Henry,	1862
Allen, Harvey	1859	Blizzard, Joseph E.	1867
Allen, John C.	1829	Blomer, Augustus P.	1865
Allen, William E.	1866	Blomer, George D.	1861
Allen, William M.	1862	Bolton, Joseph P.	1860
Andrews, John R.	1848	Bonsall, Charles T.	1853
Archibald, Henry C.	1867	Borhek, J. T., Jr.	1867
Armstrong, James A.	1855	Boring, Ed. McC.	1867
		Bourke, Joseph M.	1867
Babb, Peter	1842	Bower, Henry C.	1854
Bache, Charles L.	1849	Bowman, Henry K.	1869
Bachman, Adolphus,	1863	Boyd, Abraham	1868
Bachman, Alexander	1853	Boyd, John W.	1860
Baker, Jacob L.	1846	Boyer, Caverly	1843
Baker, James R.	1857	Braddock, Charles S.	1851
Baker, T. Roberts,	1852	Braddock, Isaac A.	1866
Baker, William G.	1842	Bradley, Thomas F.	1868
Bakes, William C.	1855	Bringhurst, Ferris	1857
Bancroft, Joseph W.	1855	Bringhurst, John	1832
Banes, John M.	1856	Brodie, Robert C.	1844
Bannvart, Charles A.	1855	Bronson, Eugene C.	1868
Barnitz, Frank M.	1866	Brooks, Edward	1830
Barr, Thomas H.	1854	Brooks, Henry	1838
Bartram, Ernest	1867	Brooks, Joseph H.	1829
Bassett, William H.,	1855	Broughton, John	1854
Bates, Louis A.	1869	Brower, Noah B.	1857
Battay, Robert	1856	Brown, Albert P.	1862
Beam, Isaac R.	1856	Brown, Frederick,	1861
Beck, John W.	1868	Brown, Frederick J.	1858
Bell, James S.	1869	Brown, Samuel A.	1867
Bell, W. D.	1860	Brown, Samuel W.	1833
Berger, Christian	1863	Brown, Thomas J.	1867
Bickley, Mortimer H.	1854	Bryan, John E.	1860
Biddle, John W.	1856	Buchanan, Wm. F.	1859
Bines, Samuel M.	1848	Buchanan, W. G.	1862
Bispham, James L.	1854	Buckman, James,	1867

Buehler, Edward H.	1864	Davis, Benjamin B.	1850
Bunn, Jonathan, H.	1857	Davis, George H.	1861
Bunting, Samuel S.	1850	Davis, Henry H.	1869
Burton, David F.	1852	Davis, John L.	1852
Buss, Oliver	1864	Davis, John W.	1853
		Davis, Robert C.	1844
Cabe, Raphael	1858	Dawes, J. Crawford	1841
Cadbury, John W.	1858	Dawson, Alexander	1827
Caldwell, James M.	1857	Day, Robert L.	1868
Campbell, Hugh	1866	De Choudens, Joseph F.	1857
Campbell, James B.	1851	De Huff, John G.	1869
Campbell, Samuel	1857	Dick, George H.	1858
Canby, George	1851	Dickson, John,	1846
Canêdo, Cipriano	1852	Dickson, John M.	1856
Carberry, P. J. L.	1867	Dickson, Robert W.	1862
Carbonell, Felix Benjamin	1861	Diehl, C. Lewis	1862
Carroll, Augustus D.	1855	Dilkes, Theodore	1856
Carter, John E.	1858	Dilks, S. Levin	1868
Carter William J.	1842	Dillard, Robert K.	1854
Chapman, Wm. B.	1834	Dingee, Charles H.	1826
Chenoweth, John T.	1856	Dingee, John H.	1828
Cheston, Elijah, Jr.	1853	Ditman, Andrew J.	1865
Chipman, Edward D.	1862	Dobbins, Edward T.	1862
Clark, A. B.	1868	Dobbins, Albert N.	1866
Clark, Thomas C.	1865	Dodson, Charles G.	1859
Clark, Thomas M.	1854	Donnelly, Edward	1843
Claypoole, John	1860	Douglass, John Wyeth	1840
Clothier, Wm. P.	1861	Duhamel, Augustine J. L.	1834
Corkburn, James, Jr.	1835	Dunton, Jacob	1855
Coggeshall, George D.	1828	Dupuy, Powhatan E.	1859
Coggins, Franklin	1863	Durand, Alfred A. B.	1851
Collom, Charles D.	1862		
Colman, Francis A.	1860	Eastlack, Horace W.	1868
Conté, Horace	1850	Eayre, Mortimer H.	1868
Coombe, Thomas R.	1859	Eberle, Charles L.	1859
Cooper, William H.	1862	Ebert, Albert E.	1864
Corbidge, J. E.	1868	Eggert, Charles H.	1854
Cornell, Charles M.	1848	Eldridge, George W.	1863
Cornell, Edward A.	1865	Elliott, Frederick G.	1868
Corse, William H.	1840	Elliott, James L.	1837
Corson, Joseph K.	1858	Elliott, William D.	1851
Costill, Samuel L.	1849	Ellis, Evan T.	1847
Cowell, Cincinnati M.	1860	Ellis, William	1834
Cox, Richard S.	1854	Emmanuel, Louis M.	1854
Craven, James	1869	England, Howard	1868
Creecy, Wm. Pryor	1860	England, Robert	1846
Crenshaw, Edmund A.	1849	Epting, Charles W.	1855
Cressler, Charles H.	1861	Erwin, Bertine S.	1867
Crew, James H.	1847	Estlack, Thomas	1844
Croft, Henry C.	1864	Evans, Jonathan, Jr.	1835
Croft, Samuel F.	1867	Evans, William, Jr.	1856
Cummings, Joseph J.	1869	Evans, William H.	1861
Cummings, William T.	1856	Eyre, William	1859
Cunningham, John M.	1864	Eyster, Christ. Ed.	1869
Cuthbert, Richard W.	1867		
		Fairthorne, Robert	1855
Dancy, Frank B.	1857	Farr, W. L.	1868
Dare, Charles F.	1861	Faunce, John H.	1853
Davis, Aaron R.	1869	Fell, Edward R.	1858

Fetter, Marcus C.	1862	Harte, James H.	1856
Figueroa, Francis A.	1858	Hartzell, Charles	1849
Finley, John D.	1851	Harvey, David W.	1859
Fischer, Theophilus.	1862	Hasbrook, William L.	1837
Fisher, William R.	1820	Hastings, Samuel	1849
Fleming, William S.	1857	Hathwell, Charles	1828
Foulke, James	1868	Hayes, George E.	1861
Fox, Daniel S.	1863	Hays, N. W. C.	1867
Franklin, Thomas H.	1860	Hecker, Jacob K.	1868
Fritchey, James G.	1869	Hedges, T. Jefferson	1861
Fritsch, Herman	1860	Heintzleman, Joseph A.	1859
Fronfield, Charles, Jr.	1860	Heller, Marx M.	1865
Fronheiser, James G.	1868	Hendel, Samuel D.	1852
Früh, Carl	1869	Hendry, Charles D,	1830
Fuchs, Peter P.	1858	Henshey, B. B.	1858
		Heydenreich, Emile	1861
Gaillard, Edward	1854	Heydenrick, F. Victor	1858
Garrigues, Samuel S.	1851	Heyser, William	1852
Garwood, W. T.	1859	Higbee, Hugh H.	1856
Gegan, James J.	1860	Higinbotham, W. Ralph	1861
Gerhart, Herman	1856	Hill, Franklin C.	1848
Gerhart, Samuel	1854	Hillary, John F.	1865
Geyer, Henry T.	1859	Himmelwright, F. E.	1867
Gibson, Robert	1861	Hoagland, Pratt R.	1868
Giffard, William H.	1861	Hoeckley, Benjamin F.	1837
Githens, William H. H.	1861	Hoffecker, James P.	1855
Gold, Hiram	1864	Hoffman, C. Ferdinand	1863
Goodyear, David F.	1851	Hoffman, John V.	1867
Goodyear, John Y.	1837	Holden, John	1852
Gormely, George M.	1852	Hollembach, William	1858
Griffith, J. Clarkson	1855	Holstein, Charles E.	1869
Gross, George A.	1865	Hopkins, James	1835
Grotjan, P. Adolphe	1842	Hopkins, Thomas C.	1839
Guillon, Alfred	1834	Hopper, Edward	1833
Gutekunst, Frederick	1853	Hornbeck, Molton E.	1862
Guthrie, Joseph T.	1856	Huber, Milton	1865
		Hughes, C. Collin	1857
Haehnlen, Jacob F.	1860	Hughes, Louis	1851
Haig, Charles R.	1867	Hughes, T. Curtis C.	1847
Haines, Thomas	1839	Husband, Thomas J.	1833
Hambright, Edwin A.	1867	Husband, Thomas, Jr.	1869
Hambright, George M.	1863	Hutchison, Hamilton	1869
Hance, Edward H.	1854		
Hancock, Charles W.	1857	Inskeep, E. W.	1858
Hand, Charles	1869	Isard, George W.	1869
Hand, Richard T.	1862		
Hansell, Amos	1858	Jacobs, Henry H.	1862
Hansell, George	1862	Jacoby, David S.	1854
Hansford, William P.	1833	Jameson, George L.	1858
Harding, Henry	1867	Jeannot, George Edward	1864
Harmer, James M.	1867	Jefferson, Charles L.	1859
Harres, J. Henry	1853	Jenks, William J.	1842
Harris, Levi H.	1854	Jones, Alfred	1852
Harris, Thomas W.	1838	Jones, Daniel S.	1843
Harrison, William D.	1861	Jones, D. Augustus	1869
Harrop, Joseph	1868	Jones, Edward B.	1867
Harry, David W	1859	Jones, Edward C.	1864
Harry, Jacob	1867	Jones, Isaac C.	1850
Harry, James W.	1865	Jones, Joshua S.	1843

Jones, Samuel T.	1864	Lippincott, Robert C.	1866
Jorden, Henry A.	1868	Little, Arthur H.	1867
Karch, Joseph	1868	Livermore, William W. D.	1849
Kaufman, John F.	1857	Locussou, Joseph S.	1867
Kay, Samuel D.	1868	Long, John C.	1861
Kearney, Howard C.	1861	Louden, G. Graves	1847
Kearney, William H. L.	1856	Macpherson, William	1860
Keen, Francis	1865	Markley, George H.	1854
Keeney, Caleb H.	1845	Marshall, Robert T.	1868
Keffer, Frederick A.	1860	Martin, Isaac J.	1835
Kelty, Clement	1869	Mason, William E. F.	1861
Kemble, Henry B.	1860	Msasenburg, T. L.	1857
Kemble, James	1861	Matthews, Charles C.	1868
Kendall, John H.	1856	Mattocks, Brewer	1861
Kennedy, Charles W.	1865	McBride, James	1856
Kennedy, Francis	1859	McCollin, S. Mason	1864
Kennedy, George W.	1869	McConaughy, Albert D.	1857
Kennedy, Robert G.	1837	McCormick, Charles	1826
Kenworthy, James	1863	McDermott, Charles A.	1858
King, William	1851	McElroy, Archibald C.	1864
Kirkbride, Joseph C.	1863	McElroy, James B.	1865
Kitchen, William K.	1835	McFee, George W.	1855
Klump, Charles C.	1868	McIlvaine, J. L.	1860
Kneeshaw, William W.	1866	McInall, Edward Jr.	1868
Knight, William E.	1838	McIntyre, William	1863
Kollock, M. Henry	1855	McKee, James H.	1861
Kolp, C. H.	1869	McKim, Andrew	1843
Krewson, William E.	1869	McLeroth, A. Hope	1859
Kuhn, Louis De Barth	1851	McMakin, Joseph A.	1845
Kurtz, Augustus M.	1867	McMinn, Joseph H.	1867
Laidley, Joseph	1850	McMullen, Jacob B.	1857
Laird, William R.	1866	McPike, William C.	1866
Lamarter, Eugene	1869	Mecray, Alexander M.	1860
Lancaster, Thomas	1855	Mecray, James	1861
Lancaster, Thomas A.	1859	Mellor, Alfred	1863
Lawall, Edmund D.	1855	Mercein, James R.	1857
Laws, James, Jr.	1848	Mercer, John T.	1857
Laycock, W.	1858	Merklein, Charles H.	1869
Leaher, Samuel	1847	Miles, John I.	1858
Leamy, James C.	1855	Milleman, Philip	1866
Lee, Clement J.	1835	Miller, Adolph W.	1862
Lee, Hiram C.	1846	Miller, William J.	1854
Lehlback, Paul Frederick	1863	Milliac, John A.	1866
Leidy, Thomas	1845	Milligan, Decatur	1861
Lemberger, Joseph	1854	Milner, James P.	1865
Leslie, Henry W.	1862	Mitchell, George H.	1844
Letchworth, Albert S.	1840	Mitchell, Thomas R. F.	1837
Letts, Charles	1861	Mittnacht, Henry	1855
Leuchsenring, Hermann	1855	Montgomery, Thomas H.	1851
Levering, P. Wharton	1866	Moore, Charles C.	1867
Lery, Lewis	1861	Moore, Joseph E.	1864
Lewis, David Jr.	1854	Moore, Orlando L.	1868
Lewis, John R.	1847	Moore, Robeson	1829
Lillard, Benjamin	1868	Moorehead, William W.	1869
Lindsay, John B.	1865	Morell, Elijah S.	1863
Link, Ferdinand	1860	Morgan, David U.	1855
Linn, Claudius B.	1838	Morris, Henry B.	1864
		Morris, J. H. Morton	1852

Moseley, A.	1867	Price, Richard	1835
Moser, Americus H.	1865	Proctor, Stephen	1834
Mullen, Wesley W.	1862	Procter, William Jr.	1837
Murray, Talbot C.	1863	Pyle, J. Lindley	1853
Naulty, William H.	1862	Rambo, Milton	1869
Neal, Leander	1857	Ramsden, Robert	1851
Needles, Caleb H.	1841	Ranck, John W.	1865
Needles, William N.	1845	Rand, Charles S.	1850
Newbold, Thomas M.	1866	Rankin, Alfred J.	1861
Newman, George A.	1860	Raser, William H.	1868
Newton, Alfred W.	1864	Rau, Robert	1866
Newton, John S.	1866	Read, Charles B.	1869
Nichols, William St. Clair	1844	Reel, Joseph	1861
Noble, Thomas	1859	Reeve, Richard M.	1832
Nolen, Albert V.	1858	Remington, Joseph P.	1866
Notson, Charles B.	1865	Reynolds, John J.	1869
Notson, George W.	1864	Rex, T. A.	1862
Ober, Gustavus	1837	Rhoads, Elam	1861
O'Brien, T. Bryan	1868	Rice, William C.	1868
Ogden, Edward H.	1853	Richards, Clayton F.	1861
Olmsted, A. J.	1835	Richards, George K.	1859
Orth, Frederick C.	1865	Richardson, Joseph G.	1857
Ottinger, Franklin	1868	Richardson, Nathaniel	1861
Painter, Emlen	1866	Ridgway, William T.	1869
Paletthorp, John H. Jr.	1854	Riley, Charles W.	1866
Pancoast, Dillwyn P.	1856	Rincker, William H.	1865
Parrish, Clemmons	1868	Rittenhouse, Henry N.	1855
Parrish, Dillwyn	1830	Ritter, Benjamin I.	1840
Parrish, Edward	1842	Ritter, Bradford	1852
Parrish, William G.	1860	Robertson, Henry E.	1869
Parry, George R.	1862	Robinson, Edward T.	1853
Patrick, George W.	1846	Robinson, James S.	1869
Patterson, Robert M.	1846	Robinson, Joshua K.	1866
Paynter, Woodman S.	1856	Robbins, Alonzo	1855
Peck, Aulay W.	1869	Robbins, James W.	1859
Peck, H. T.	1862	Roche, William F.	1867
Pedrick, Charles W.	1855	Rohrbacher, Frederick	1857
Peltz, Richard	1852	Rohrer, Earl Penn	1863
Penrose, Stephen F.	1869	Ross, H. H.	1866
Perot, Elliston L.	1855	Ruan, James	1863
Perot, Joseph S.	1852	Rubincam, Charles E.	1865
Perot, T. Morris	1849	Ruch, John H.	1855
Perrot, E. Raphael	1856	Rulon, Edwin	1860
Peterson, Weatherill	1851	Rush, Charles S.	1847
Pffromm, Adam	1869	Rushton, Richard	1838
Phelps, Frederick H.	1869	Rutherford, Charles A.	1865
Pile, Gustavus	1866	Santos, Charles A.	1848
Pile, Wilson H. Jr.	1861	Savery, John C.	1851
Pleasants, Charles E.	1829	Savery, William Jr.	1853
Pollard, Oscar	1853	Sayre, Lucius E.	1866
Pollit, Edmund	1848	Scattergood, George J.	1856
Potts, Robert B.	1838	Scattergood, Joseph	1829
Powers, Thomas H.	1833	Scheller, Thomas K.	1861
Pratt, William H.	1856	Schellinger, Clarence M.	1868
Preston, David	1865	Schively, William H.	1842
Price, Ferris	1869	Schmidt, Christian	1862
		Schultheis, Christian	1864

Schurk, Peter Jr.	1857	Spencer, Hallam H.	1858
Scott, Thomas J.	1846	Stackhouse, David L.	1854
Seeger, Roland	1859	Stackhouse, George P.	1868
Segner, William	1866	Stanhope, W. Bellingham,	1856
Seiler, Robert H.	1858	St. Clair, Theodore A.	1862
Selfridge, Matthew M.	1852	Steele, Oscar,	1849
Senneff, Jacob,	1862	Steen, James H.	1857
Seuret, J. Pedro,	1857	Steever, Henry C.	1854
Seybert, Robert L.	1868	Stein, Jacob H.	1869
Sharp, Robert C.	1869	Stell, John J.	1858
Sharpe, William,	1826	Stevens, Hennell,	1853
Shaw, Joseph B.	1868	Stiefel, Louis,	1868
Sheaff, John F.	1853	Stoever, Charles F.	1846
Sheridan, John I.	1860	Stoever, J. Melancthon	1861
Sheridan, Richard B.	1861	Stokes, Isaac W.	1849
Sherman, Oliver G.	1858	Storks, J. Scott,	1869
Shick, Andrew J.	1856	Stratton, James,	1851
Shinn, James T.	1854	Strehl, Louis,	1866
Shinn, Samuel E.	1850	Swaim, George M.	1867
Shinn, Walter,	1839		
Shivers, Charles, Jr.	1867	Tait, Stewart,	1867
Shoemaker, Allen,	1866	Taylor, Alfred B.	1844
Shoemaker, Benjamin	1866	Taylor, Alfred Lafayette,	1847
Shoemaker, Charles,	1866	Taylor, Harry B.	1869
Shoemaker, Richard M.	1862	Taylor, Horace B,	1857
Shoffner, John N.	1868	Taylor, James,	1867
Sholl, Alfred K.	1847	Taylor, William,	1851
Shreeve, Charles S.	1835	Thomas, Edwin,	1864
Shrom, Charles F.	1853	Thomas, Frank W.	1868
Shropshire, Joseph B.	1868	Thomas, Jason P.	1863
Shryock, Allen,	1868	Thomas, N. Spencer,	1847
Shugard, B. F.	1868	Thompson, William,	1856
Siddall, Francis H.	1856	Thompson, William B.	1858
Siddall, R. J.	1861	Thompson William H.	1854
Sillyman, Lewis T.	1858	Thompson, Samuel,	1834
Simes, J. Henry C.	1864	Tilge, F. A.	1863
Simes, John W., Jr.	1836	Tilghman, John H.	1834
Simes, Samuel,	1833	Tobey, Avery,	1849
Simes, Samuel,	1867	Tomlinson, Edwin,	1863
Simes, Samuel F.	1867	Tourtelot, Frank T.	1858
Simon, Matthias,	1868	Tredenick, John B.	1863
Simons, Charles W.	1838	Treichler, L. Alpinus,	1869
Simson, William H.	1866	Trimble, David,	1834
Simpson, George T.	1866	Trimble, Joseph,	1834
Smedley, Bennett L.	1862	Troth, Henry M.	1851
Smith, Ambrose,	1834	Tuller, Charles,	1861
Smith, Benjamin R.	1846	Turnbull, Lawrence,	1842
Smith, Edwin R.	1863	Turner, Joseph M.	1836
Smith, Ephraim K.	1861	Turnpenny, Joseph C.	1833
Smith, Franklin R.	1829		
Smith, Homer A.	1868	Unzicker, Charles B.	1869
Smith, Isaac Jones,	1830		
Smith, Isaac W.	1858	Vandegrift, J. P.	1867
Smith, Jacob L.	1844	Vogelbach, Edmund,	1865
Smith, Theophilus H.	1859	Vogelbach, Hermann A.	1860
Smith, Wilson B.	1865		
Smyser, George M.	1862	Wagner, Joseph,	1860
Souder, Joseph A.	1866	Walker, John T.	1865
Southall, Turner H.	1853	Walker, Thomas A.	1866

Wallen, Jarvis R.	1869	Wiegand, Thomas S.	1844
Ward, John,	1859	Wiggan, George T.	1848
Ware, Frank	1869	Wike, Albert D.	1867
Ware, Samuel F.	1869	Wilkins, Charles M.	1848
Warner, William H.	1858	Wills, Clayton N.	1862
Warner, William R.	1856	Wilson, Adam H.	1856
Watson, William J.	1853	Wilson, Charles,	1868
Weatherly, Wm. Henry,	1861	Wilson, Edwin K.	1869
Weaver, Thomas,	1856	Wilson, James,	1860
Webb, Samuel W.	1867	Wilson, Pierre B.	1858
Webb, William B.	1845	Wilson, William,	1868
Webb, William H., M.D.	1868	Wirgmann, Charles,	1869
Weber, Henry J.	1863	Winter, Jonas,	1860
Weichselbaum, J.	1867	Witmer David L.	1862
Weideman, Charles A.	1867	Wolfe, Isaac G.	1869
Weiser, Thomas D.	1858	Woodruff, A. Dickinson,	1838
Welding, Watson J.	1833	Woods, Charles,	1861
Wells, James G.	1860	Woodward, Charles E.	1867
Wendel, Edward,	1865	Worthington, Henry W.	1838
Wendell, Frederick,	1865	Wright, Peter T.	1846
Wendel, John,	1860	Wyeth, John,	1854
Wents, Silas H.	1844		
Wenzel, William T.	1855	Young, Joseph,	1857
Wetherill, J. Bloomfield,	1857	Young, Joseph E.	1855
Wetherill, Samuel,	1842		
Weymer, Harry B.	1869	Zeitler, Edward,	1858
Whartenby, John A.	1846	Zieber, Jacob B.	1857
White, James,	1865		

SUMMARY.

Year.	Graduates.		Graduates.
1826,	3	1850,	7
1827,	1	1851,	19
1828,	3	1852,	14
1829,	7	1853,	17
1830,	4	1854,	26
1832,	2	1855,	26
1833,	8	1856,	28
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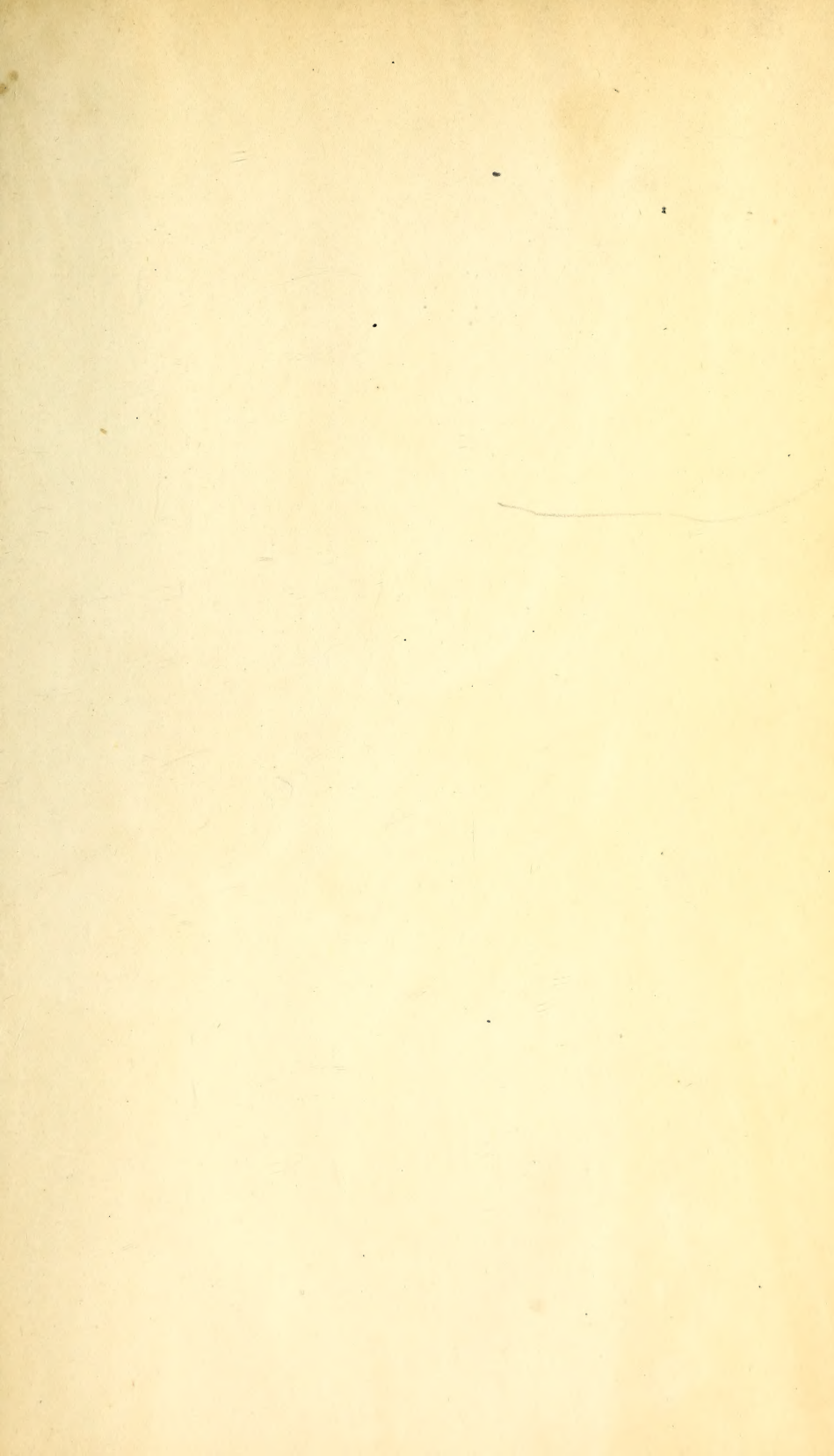
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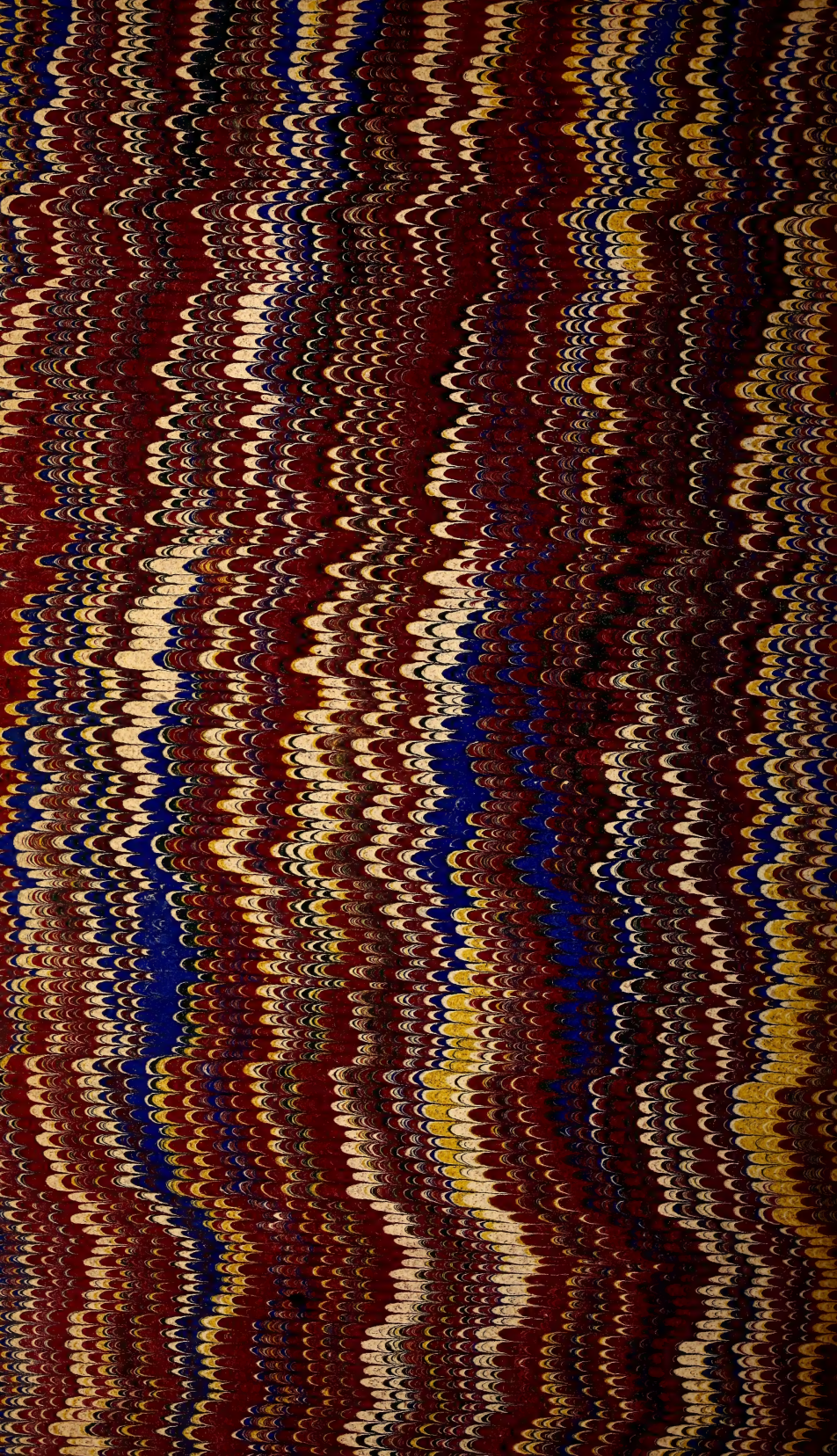
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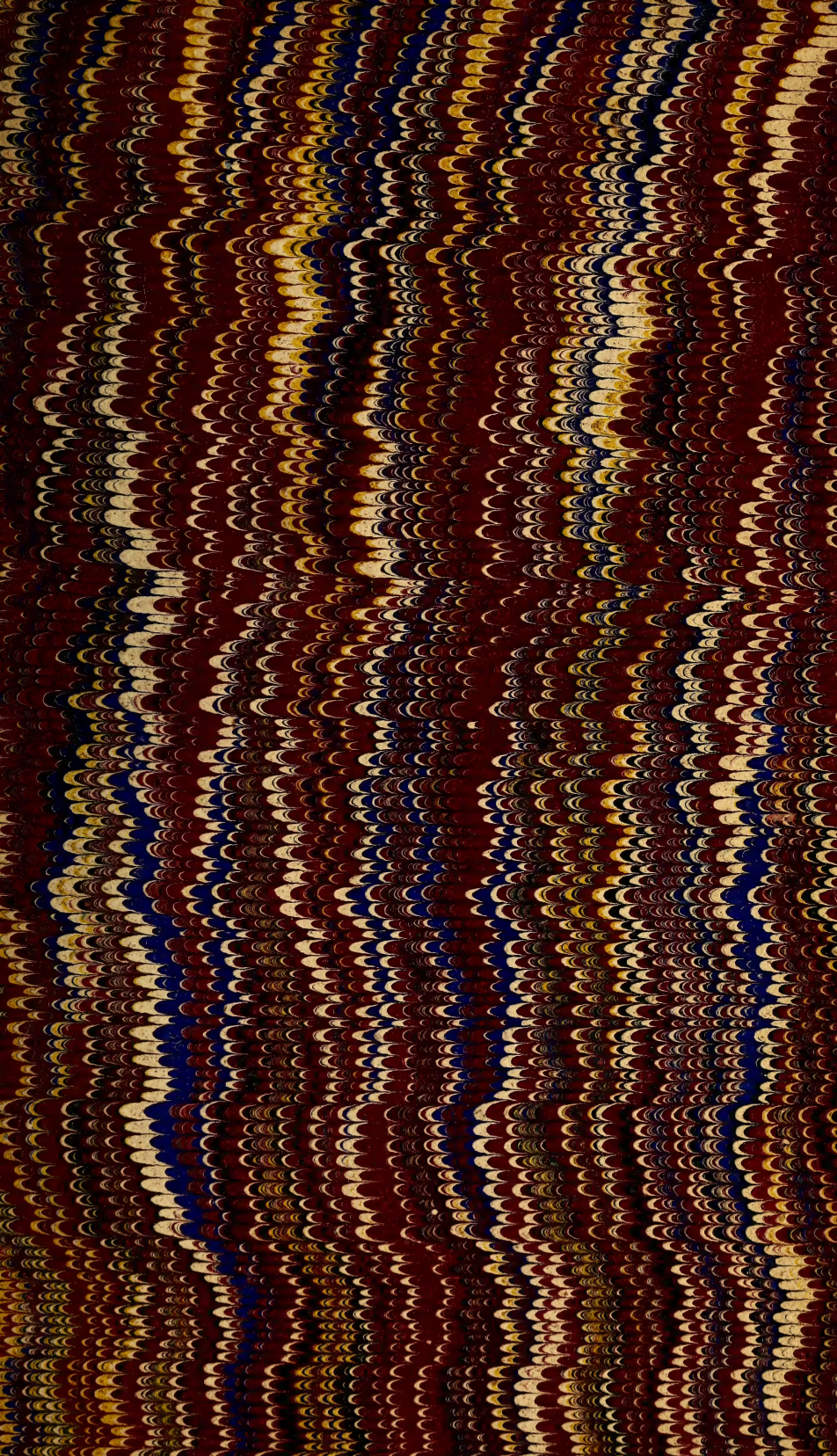












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